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PROCEEDINGS OF THE CONGRESSIONAL COPYRIGHT AND TECHNOLOGY SYMPOSIUM

PREPARED AT THE REQUEST OF THE

SUBCOMMITTEE ON PATENTS, COPYRIGHTS AND TRADEMARKS

FOR USE OF THE

COMMITTEE ON THE JUDICIARY UNITED STATES SENATE

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LETTER OF TRANSMITTAL

U.S. SENATE,
SUBCOMMITTEE ON PATENTS, COPYRIGHTS AND TRADEMARKS,
Washington, DC, June 28, 1985.

Hon. STROM THURMOND,
Chairman, Committee on the Judiciary,
Washington, DC.

DEAR MR. CHAIRMAN: On February 4 and 5, 1984, a remarkable symposium was held in Fort Lauderdale, Florida, on the topic of copyright and technological change. At the request of the Subcommittee on Patents, Copyrights and Trademarks of the Senate Judiciary Committee, and of the Subcommittee on Courts, Civil Liberties and the Administration of Justice of the House Judiciary Committee, the Copyright Office of the United States assembled a diverse group of legal scholars, business figures, and technologists to share their insights with Members of Congress, congressional staff, and other invited participants. The goal was to learn more about the rapid technological progress that is transforming the way we express ideas and process information, and to discuss how our system of intellectual property laws might best respond to these sweeping changes. As a participant in the symposium, I can report that the program succeeded in highlighting some of the challenges that face the Subcommittee on Patents, Copyrights and Trademarks and its House counterpart today.

The Library of Congress has prepared an edited transcript of the proceedings of the Congressional Copyright and Technology Symposium. I write to request your authorization to have this transcript printed as a document of the U.S. Senate Committee on the Judiciary. I believe that this publication will prove useful to the Members of Congress and their staffs who were unable to attend last year's symposium, and to members of the public concerned about these important issues.

Thank you for your consideration of this request.

With best wishes,

Sincerely,

CHARLES MCC. MATHIAS, JR.,
Chairman, Subcommittee on Patents,
Copyrights and Trademarks.

CONGRESSIONAL COPYRIGHT AND TECHNOLOGY SYMPOSIUM OUTLINE

DAY I: SATURDAY, FEBRUARY 4, 1984

8:00–9:00, Coral Springs-Plantation Room

Buffet breakfast.

9:00–9:15, Amphitheater

Opening of the symposium—Senator Charles McC. Mathias and Representative Robert W. Kastenmeier.

9:15–9:20, Amphitheater

Introductory remarks—Register of Copyrights David Ladd and Symposium Rapporteur Paul Goldstein, Stanford Law School.

9:20–10:00

Overview—"Electronic Technology for the Policy Maker," Haines Gaffner, president, LINK Resources, Corp.

10:00–12:00, Board Room 1, and Meeting Rooms D&E [with coffee available during session]

Applications: present and future—Sessions will include equipment demonstrations and opportunities for hands-on use of a variety of equipment, systems and services representative of the following technologies:

Broadcast, cable, and satellite transmission systems: to demonstrate projected capabilities of broadcast, cable, and satellite technologies, including two-way interaction and satellite services.

Home computers and electronic entertainment centers: to demonstrate the future integration of computer and communications systems to provide capabilities to use copyright works in new ways.

4:00–7:00, Board Room 1 and Meeting Rooms D&E

Applications—Continued.

Educational technology: Application of interactive computer-aided instruction, electronic libraries, and video technology to modern education.

Electronic publishing: New Systems for specialized publication, videotext, teletext, viewdata, etc.

Optical disks and automated libraries: Library of Congress System.

7:30–8:30, Grand Ballroom C

Reception.

8:30, Grand Ballroom D

Dinner—"The Long-Range Future Impact of Computer and Communications Technology on Society": Martin Greenberger, IBM Professor of Computer and Information Systems, UCLA. Author of numerous books on science policy including "Computers, Communications and The Public Interest."

DAY II: SUNDAY, FEBRUARY 5, 1984

8:00–9:00, Bonaventure A

Buffet breakfast.

A series of panel discussions on the future impact of technology on intellectual property.

9:00–10:15, Amphitheater [with coffee available during session]

Panel discussion I: information processing in the future; Moderator: Joe B. Wyatt, Chancellor, Vanderbilt University; Panelists: Christopher Burns, Information Consultant IIA; Donald Devine, Chief Executive Officer, Trilog Inc. ADAPSCO Software Protection Committee; E. C. McIrvine, Manager of Advanced Planning, XEROX Corp.; Frederick Weingarten, Office of Technology Assessment.

10:15–11:45, Amphitheater

Panel discussion II: publishing, libraries, and education; Moderator: Toni Carbo Bearman, Executive Director, National Commission on Libraries and Information Science; Panelists: Hon. Stephen Breyer, Judge, U.S. Court of Appeals for the First Circuit; Karen Hunter, Planning Officer, Elsevier Science Publishers, B.V.; Joseph P. Lash, Author; Jay Lucker, Director of Libraries, Massachusetts Institute of Technology; Warren Spurlin, Deputy Superintendent, The School Board of Sarasota County, Sarasota, Florida.

3:30–5:00, Amphitheater

Panel discussion III: mass media distribution: the future; Moderator: Professor Harvey Zuckman, Director of the Communications Law Institute, Columbus School of Law at the Catholic University of America; Panelists: Bryan L. Burns, Director of Broadcasting, Office of the Commissioner of Baseball; Mel Harris, President, Paramount Video; Gustave M. Hauser, Chairman and Chief Executive Officer, Hauser Communications; William Lilley, III, Vice President, Corporate Affairs, CBS, Inc.; Clyde Washburn, Chief Scientist, Earth Terminals, Inc.

5:00–6:30, Amphitheater

Panel discussion IV: administration of rights in copyrighted works in the new technologies; Moderator: Professor Alan Latman, New York University Law School, and member of Cowan, Liebowitz, and Latman; Panelists: Thomas C. Brennan, Chairman, Copyright Royalty Tribunal; Harlan Cleveland, Director of the Hubert H. Humphrey Institute of Public Affairs, University of Minnesota; Alexander Hoffman, Senior Vice President, Doubleday & Co.; Professor John Kernochan, Columbia University Law School; John C. Taylor III, Chairman of the Carnegie Corporation and member of Paul, Weiss, Rifkind, Wharton & Garrison; George Willoughby, Vice President and General Counsel, King Broadcasting.

6:30–7:00, Amphitheater

Rapporteur's summation: Professor Paul Goldstein, Stanford Law School.

7:30–8:15, Atrium area

Reception.

8:30, Global Ballroom B

Dinner—"Trends, Developments, and Projections: Frederick Pohl, prize winning science fiction author and editor.

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CONGRESSIONAL COPYRIGHT AND TECHNOLOGY SYMPOSIUM

SUMMARY OF PROCEEDINGS

Day 1: February 4, 1984

Opening of the Symposium—Remarks by Rep. Robert W. Kastenmeier, Senator Charles McC. Mathias, Jr., Librarian of Congress Daniel Boorstin, Register of Copyrights David Ladd.

Overview—"Electronic Technology for the Policy Maker," Haines Gaffner, President, LINK Resources, Corp.

Introductions to Demonstrations—Donald Devine, Chief Executive Officer, Trilog, Inc.; Pat Wilson, North American Consumer Electronics; John Sabio, SATTECH; Bob Quinn, NABU Network; and Gene Leonard, VVR Associates.

Educational Technology—Jean Harris, Vice President, Control Data Corporation; and Karen Cohen, President, Continuous Learning Corporation.

Electronic Publishing—Myer Kutz, John Wiley & Sons, Inc.; Albert Crane, Extravision Service, CBS TV; and John Wooley, Editor, View Data Corporation.

Optical Disks and Automated Libraries—Joseph Price, Chief, Science & Technology Division, Library of Congress; Steven Gregory, New England Technology Group; and John Hartigan, SONY Corp.

Dinner speech—"The Long-Range Future Impact of Computer and Communications Technology on Society," Martin Greenberger, IBM Professor of Computer and Information Systems, UCLA.

MORNING SESSION

TRANSCRIPT OF PROCEEDINGS, FEB. 4, 1984

INTRODUCTORY REMARKS

GOLDSTEIN. Good morning. My name is Paul Goldstein. I'm Professor of Law at Stanford Law School. I'm very happy to welcome you to this weekend's Congressional Copyright and Technology symposium. I will be serving as the rapporteur for the program, summarizing the lessons that I hope will be exposed here during the next two days.

Let me alert you, before we proceed, that in the spirit of the new communications technologies to which this symposium is devoted, all of the mikes are live. All you need to do to speak into them is to pull them toward you. I needn't tell you what to do if you don't wish to have your remarks overheard by others.

Now, obviously I will have more time toward the close of the session to put in my two cents' worth. Let me just say now by way of

introduction that, like you, I believe that technological advance is central to our nation's welfare. And like all—or at least, I hope, most—of you, I believe that technological advance depends not only on our native ingenuities, but also on the ability of systems of intellectual property to help foster innovation in ways that are both efficient and equitable.

This symposium represents in my judgment an extraordinary, and extraordinarily important, step toward obtaining a thoroughly objective, unbiased understanding of the public policy implications of copyright law and the new technologies.

Now, we are very fortunate to have with us the leaders from the Senate and the House respectively dealing with copyright matters—Senator Charles Mathias and Representative Robert Kastenmeier.

Congressman Kastenmeier, would you like to start us off with a few remarks?

Mr. KASTENMEIER. Thank you, Mr. Goldstein. It was a pleasure meeting you just earlier this morning, and meeting many of the others who have come here. I'd like to extend a welcome to Senators and to my fellow House members, and to those otherwise participating here at this symposium.

Senator Mathias and I particularly are grateful to the Copyright Office, especially David Ladd, for undertaking the actual implementation of an idea that the Senator and I have thought about for some time, to hold just such a meeting. We were finally able to bring it about. But I am very pleased that we are here away from many people, away from Washington and the pressure of business there or other places, so that we could be here in a beautiful and somewhat detached environment to consider what I think are important questions.

The object of helping to shape copyright or other intellectual property laws in response to the greatest technological changes in history is our challenge. We all know that the state of the art—including computers, electronic communications—is such that it's almost impossible for the casual citizen to remain even vaguely conversant with the implications, or master the technology in anything.

Our children obviously seem to be more able to adapt to these changes than some of us. We nonetheless have a responsibility to satisfy. And in fact, we have been given opportunities in the past to recognize our responsibility.

In 1976, a major revision of our copyright law gave us a taste of trying in some respects to adapt the law to technological change. Even then, with respect to precise language regarding computer software and cable television, for example, we either had to temporize in terms of the law, or recognize that we would not be able to respond until some later time.

In the House, we have been holding hearings on "copyright and technological change," so as to enable us to see even contemporary questions of conflict among industries, proprietors and users of copyrighted works in what is obviously an environment of an explosion of litigation and political contest, much of it suggesting or demanding statutory change.

We face that environment today. And we faced it last year and the year before. In order to better grasp its implications with respect even to today's challenge, much less to tomorrow's, and so that intellectual properties law, particularly copyright law, can be a little wiser, a little more comprehending, in responding to technological changes, we have urged the convening of this symposium.

We hope that both those who tell us what's going on, those who participate, and ultimately all of us, will in a broader sense learn something from these several days here. We then will be able to communicate it to others, most notably for our part to our fellow colleagues in the Senate and House, and we will be able to somewhat more wisely respond to both changes today and changes tomorrow that are indicated with respect to copyright law. We would rather not be reactive. We would rather understand and anticipate, if that were possible.

But in any event, we do hope to leave this place a little wiser and a little better informed.

And so I congratulate you all for coming, and express appreciation for those of you who contribute positively to the proceedings. And I wish you all luck.

Thank you.

Mr. GOLDSTEIN. Thank you, Congressman Kastenmeier. Senator Mathias, do you have a few remarks?

Mr. MATHIAS. Thank you very much, Mr. Chairman. I just want to join with Bob Kastenmeier in saying a word of welcome to everyone who is here.

In his lucid and lawyerlike dissent in the "Betamax" case, Justice Blackmun said: "Like so many other problems created by the interaction of copyright law with a new technology there can be no really satisfactory solution to the problem presented here until Congress acts."

In one sentence, Justice Blackmun has defined our purpose and our goal in this meeting.

But, as the old spiritual suggests, talking about heaven and getting there are two different things.

In a normal period of history new inventions are perfected and come to the market in a more or less orderly way, at a gradual pace and with time for consumers, entrepreneurs, technicians and, finally, the law to make normal adjustments to accommodate the new technology. But the climate in which we are meeting is different. We are witnesses not to gradual change, but to revolution. Like many revolutions, it not only threatens to overturn the obstacles immediately in its path, but also to topple or overthrow the basic principles of law and order. We are not only learning new ways to communicate, record, transmit, store, retrieve, and manipulate every form of sound, data and information, but in the process we are threatening the ability to maintain the principle of intellectual property—the principle of copyright.

I have thought about analogies in history to our situation, and the image of Prince Henry of Portugal came to mind. I thought of Henry the Navigator, standing in his school for sailors at Sagres, on top of the great cliffs that line the shore, looking out to the horizon and wondering what lay beyond. But at least Henry the Navigator knew what he was up against. He knew the sea, its history,

its habits, its dangers and something about how to live with it. We are not so well-informed about our problem.

Perhaps we are more like Balboa (notwithstanding Keats' Cortes), "Silent upon a peak in Darien". When Balboa first saw the Pacific Ocean, the great South Sea, he could hardly have known what he was seeing. A great sheet of water lay before him, but what it was, how far it extended, what shores it lapped and what it meant were all matters of conjecture.

That is more like our situation. We know that we are on the edge of a great unknown and that is why we are gathered here.

I am sure that I speak for every one of the Congressional pupils at this seminar in thanking the Register of Copyrights, the Librarian of Congress and their staffs, the participating industries, the lawyers and judges, the professors, the scholars and the authors who have joined here in an effort to lighten our darkness. I only regret that Alan Latman is not able to be with us.

I hope that we shall leave this meeting with a better sense of what it is that we need to do. But my optimism is qualified. Justice Blackmun, with his customary personal courtesy and with the traditional observance of comity between the coordinate branches of govenment, did not include the Congress in his indictment "that the Court has tended to evade the hard issues when they arise in the area of copyright law". Those of us who lived through the prolonged debate over a modest amendment to accommodate the juke box know that the Congress is as guilty as the Court.

We should resolve to leave this meeting not only equipped with new information, but with a new will to adapt the new technologies to the tested principles of copyright and to preserve the concept of intellectual property that maybe more important to the future than it has been in the past. Mankind has progressed in its idea of property. Once a shepherd had to keep his flock in sight at all times. Then the recording of title developed and constant physical possession was no longer necessary. We then accorded ideas and creative thoughts the character of property and protected it by copyrights so that it could be released from vaults and archives and be made abundantly available to all who could use it without prejudicing the creative rights of the author.

We now suspect that such subjective property, perhaps never even embodied in such a corporeal form as writing, will be more and more important to modern civilization. If this evolution is to take place in an orderly way, without destroying the base of intellectual property and crushing the creative spirit, then we must make the best possible use of the next 48 hours.

Thank you very much.

[Applause.]

Mr. GOLDSTEIN. Senator Mathias, Congressman Kastenmeier, thank you very much for being with us. Thank you also for your fine introductory remarks.

We're also fortunate in having with us today the Librarian of Congress, Daniel Boorstin, who has graciously made time available from his schedule to be with us. Dr. Boorstin, do you have some remarks?

Mr. BOORSTIN. I might just add a word to what we've heard. First, I would like to thank Congressman Kastenmeier and Senator

Mathias for having sparked this meeting. Their interest not only in what we are doing, but in what we ought to be doing and what we might be doing in the future has been very important to us at the Library.

I would like to spotlight briefly the special significance of the fact that this meeting is being held under the auspices of the Library of Congress, our national library. Perhaps in no other country in the world would a conference of this kind be held under the auspices of the national library. Our national library expresses an especially American symbiosis—of the world of learning and the world of representative government. The unique comprehensiveness of our national library, which we call a multimedia encyclopedia, alone of all national libraries includes the products of all technologies, photography, phonography, broadcasting, electronics and the others still to be.

We at the Library of Congress are committed, jointly with the Congress, to facing the problems and opportunities of technology.

Justice Stevens in the majority opinion in the Sony case observed that the phenomenon of copyright itself is a byproduct of the great technological advance, perhaps the greatest technological advance in human history, the development of printing. And it was that technology that gave rise to copyright, as Senator Mathias has observed, and it is the changing technology that poses the problem we want to think about today.

The history of technology, perhaps more than any other kind of history, is full of premature obituaries. We are prone, especially in this fastmoving country, to what I would call the displacive fallacy, to believe that every new technology displaces some old technology. That television will displace radio, that electronic news will displace print journalism, that the automobile will displace the human foot, and that television will displace the book.

But each of these new technologies has prepared new roles for earlier technologies, and that is our concern here today. The development of technology is not simply displacive, it is cumulative.

Every older technology is iridescent, and appears in a new light from every new technology. We are especially fortunate today in having with us people who are so well informed, people on the frontiers of these problems. We want to thank them, we want to thank all of you for this collaborative effort. And we hope that out of this will arise not only an illumination of this problem, but new opportunities and new tasks for the Library of Congress.

Thank you.

[Applause.]

Mr. GOLDSTEIN. Thank you, Dr. Boorstin David Ladd, the Register of Copyrights, has played a central role in putting together this symposium. David is with us. David, do you have some remarks?

Mr. LADD. Thank you, Paul. I take it as my principal assignment to get out of the way as quickly as possible, having attended to the mechanical details, so that we can get into the program after those very interesting and welcoming speeches that you've heard.

Congressman Kastenmeier and Senator Mathias have told you about the origins of the idea for a meeting like this. And everyone here in this room is fully aware of how typical and numerous

and—within the last two decades at least—how rancorous the debates about copyright policy have become.

So we deemed it our purpose here to try to provide a symposium where people can get the long view, or at least as long as we are capable of, in terms of what the horizon is, in terms of technological change, and what problems that change are likely to pose in the adaptation of copyright.

To accomplish this, it was our purpose to invite here those from the hardware and software industries, from the copyright industries affected, and those people who could give us the full range, and the full spectrum of opinion on these various issues, and to create a climate in which these issues were approached descriptively and analytically, rather than polemically.

And that's why in the letters of invitation that went out, we urged that those people who did participate come prepared to discuss the issues in that mode. And I simply want to remind you of how important that approach will be to the success of our meeting.

In the end, you will judge how successful you and we together have been in creating that climate. In the meantime, I simply want to thank all those people who have generously responded to our invitation, those from the industries which are providing equipment here for us to see how it is used, from those of the industries that have interests at stake in the issues we are to discuss. And above all, for those people on our own Copyright Office staff who have worked so hard, and often under difficult circumstances, to put this meeting together.

I want to tell you also that this meeting is being videotaped. We do not know, we'll have to discuss later with the staffs and the committees, how those tapes are to be used. But the entire proceedings here will be captured on videotape.

Now, let me lead you into the substantive program for this morning. And it's my pleasure to introduce Haines Gaffner, whom I met for the first time at this meeting. Haines is founder and president of LINK Resources, Inc. It is a leading computer, communications and technology research group in New York. It serves 300 worldwide companies in their planning and implementation of projects which use the new electronic technologies. He has 25 years of experience in the information industry, and we are going to be the beneficiaries of that experience this morning.

Haines, will you lead us into an overview of this morning's program, and shepherd the work of the morning for us?

OVERVIEW: "ELECTRONIC TECHNOLOGY FOR THE POLICY MAKER"

Mr. GAFFNER. Thank you, David. Good morning. I was trying to figure my role in this as we serve these 300 companies. And it's kind of like when Henry of Portugal had—Henry the Navigator saying, I want to take this trip. He had to turn into a geographer and say, what is this going to do for Portugal, is it going to make any money or not. So that's the role that LINK and myself play, working entirely in the commercial arena.

I know very little about the legal aspects of the copyright issue. And I'm not acquainted at all with what goes on in Washington and the problems it takes to bring about the statutory change. My

role is strictly to help companies that are creating these new technologies, to exploit them in the marketplace and make money and not lose money. Because in this new electronic media arena, far more money today has been lost than made.

And my role this morning, then, is to take you on a tour of these technologies as a prelude to your hands-on demonstrations which are set up. And with all the electronics working, I'm sure that you'll be able in this 48 hours to have a lot of experience in trying these various devices.

Also, I hope in an overview to define some of these technologies and put them into some perspective. That is one of the toughest challenges in this field. I would say that during the 45 minutes that I'll be talking, I would encourage questions. I think that's why we're here, that's why we have a small group of us. We didn't want a congress of two or three hundred people.

So if you want a definition of a certain technology or to raise a question, that's the purpose of these meetings.

I tried to put myself in your shoes, with the responsibilities you have as congressional people, in so many different subjects. How can you avoid getting caught up in the unfolding complexity of these technologies, and especially, you're victim to what so many people are, of the hype that the press gives to this whole field. They have a real relationship with direct broadcast satellite and personal computers. And every day there are three or four articles in the paper. It must be confounding.

So I'd like to present six simple guidelines that I hope I'll be able to put over in this tour. First, and this is going to be the hardest you've got to keep the focus on the content and the software and the intellectual property—all these terms are used synonymously. In fact, that's one of the problems with the new media, is that there are so many different terms that mean the same thing.

We happen to use the new electronic media as an umbrella term for what you use, new technologies, all of these are synonymous. But as you listen, you've got to think simply of what will my decision making role be regarding software or the content.

Now, that might sound simple, but the reason that it gets confusing is that the second point is that change is all going on from the creation of the software on through the system. And the first major area of turmoil is in the conduit transmission distribution area. And I'm going to show you several slides up front that show from some different perspectives that we're really talking about the basic characteristics that are common, and that once you've got the software, there's just a whole range of different ways to transmit it.

Our company just spends all of its time in this area and in the commercial arena. We're up to 35 people. And this is an explanation of, some slides that say IDC on it, that's our parent company. Our parent group publishes such publications as Infoworld, Computer World, about 50 publications around the world in this area. And we focus on the research side of it, based in New York. But are totally dedicated to the new electronic media.

Now, these are some of the systems that we will be talking about. Some of the technologies you've heard about. And what I'm trying to say is, don't get hung up on these various systems, be-

cause they're going to be continuously changing. That rule number two is that you've got the area of transmission or distribution, and to get a handle on the fact that all software is transmitted somehow. That's a good goal.

The third rule is that after it's distributed, it has to be accessed by some device, a personal computer, a TV set, a video cassette recorder, so that there's all this turmoil going on in the access device, which we sometimes call equipment, sometimes hardware. But that's the tool that is used by the individual to access it. So there's three things. You've got the software created, you've got the transmission, and the access device. And the turmoil is all occurring in the distribution and the access device. But it shouldn't really hamper your ability to focus on the software.

This is one of the problems that you face, is that the venture capitalists and the people putting up the money are constantly trying to stay behind the blade. But you having to do the law also have those challenges. Because all of this turmoil is going on, you can't create a law too soon. And one area, Dr. Boorstin mentioned, for instance, this cumulative effect. The problem with cumulative effect is that many of these technologies are there for only a year or two, and then die out because of some new one coming along. And some of them are actually foisted on the public and you don't know it until they're on the marketplace and the market doesn't respond.

So another area to think about is the—when you talk about all the Bell companies, ATT breakup, is the fact of separating in your mind national distribution via satellite and local distribution or local loop, which is the cable system. And you don't have—there's all these technologies that take place either on a national basis or a local basis. And a lot of the fighting is going on in that arena. But if you can just come away from 48 hours of understanding that that's another major rule area.

The fifth one is—and it's tough—trans media analysis. The problem is, a person in the cable industry only thinks cable and the person in personal computers only thinks personal computers. But what you've got to do, people with your responsibility, is recognize that you're dealing with a total spectrum, and something happening here affects what's happening in another technology. So you've got to look at the whole arena.

And the last point is that you often hear the term convergence. This is all coming together, there's no doubt about it. And the problem with convergence is, it makes each of the individual parts transparent. So it's more difficult to see in looking at a TV screen, something coming over it, all of the various networks and systems and technologies that brought it there.

Now, let's take a look at this two year old slide. I'll tell you that today only two of these are really successful so far in the marketplace. Now, we're an unbiased analytical company; we have no axe to grind. So things I say will not necessarily be agreed to by others. But the real winners here, the real winners are the videocassette recorder and the personal computer, which are over there broken out as stand-alone devices.

Now, granted, both of them are now being used as access devices to systems, so you can see that they are even becoming one-way

and two-way. When you put a modem on a personal computer it becomes a terminal. But still, much of the growth of the PCs that made it the hottest item in the last two years has been the stand-alone software that you can use on it, without even having to communicate over any transmission lines. And the vidocassette recorder, you can rent these tapes, use these tapes, stand alone, turn them back again, two bucks a night.

Now, the rest of these are all doing fine. Of course, we've all heard about the problems of cable; videotext, which was formerly Vudata, has not fully gotten off the ground yet. On line data bases are growing at 15 percent, 20 percent a year. But many of the technologies you hear about come and go.

Another thing to focus on is that these channels that you're looking at that are constantly changing have a number of applications they are involved with. And we're focussing today—we're looking primarily at education and information and entertainment. But you've heard a lot about home banking. The banks are getting very involved in exporting these for transactional purposes. Ad agencies are trying to use these same channels to put advertising over them, et cetera.

Now, one of the problems in Washington, from what I've heard about it, are the number of lobby and interest groups that use these. And this just gives you an idea of the types of companies who are coming into this arena from various perspectives. Again, let's go back to those principles. You've got those companies on the left who create the intellectual properties. That's the ones which I imagine—and I'm not an expert in your field, that you are primarily concerned with protecting.

Then you have all of these various companies, very powerful companies like AT&T, GTE, the cable companies, the time sharing companies, all of those companies are transmitting it. They don't really care that much about who's being paid what as long as they can get it out to the user and be paid for it, and make a profit doing it.

And then you've got those companies that create the devices, the equipment. And they are often coming out of the computer electronic arena; they are the ones you put your hands on and use them.

On this slide, that's the software, the intellectual property. I'm going to read it quickly. Now, remember my point about national and local distribution. That's the main purpose of this slide, is to get a good understanding of the differences generally between national and local.

But over here on the left, and again, this is not changing so much, the software. We have film, sports, information, news, education, music, culture, advertising, games and messages. Okay, that's the software, that keeps coming out from the creative individuals. Then how it gets through the system is where the problems come up that you face.

And as you can see, in the national distribution, you have the electronic means of distributing it. Or for stand-alone type of material, then you have therein physical properties. And they move to retail stores or increasingly by mail order, advertising, direct response. And in the local outlet then, you have your local broadcast-

ing affiliates, the cable systems that are working in a given environment, just like Fairchild County is now being wired. And then you have all of these various acronyms that you'll continuously get confused about.

Now, let's go into your home. How many of you here today have a videocassette recorder at home? Okay, 50 percent. How many have a personal computer at home. About the same, 50 percent, already. How many have a video disc player? Some real braves ones, okay. How often do you use it, Chris?

Anyhow, remember the comment about convergence and transparency. Most people are not going to have all these devices and it really doesn't matter. The main application in the home is entertainment and how that entertainment gets there. These are a variety of technologies that can deliver it, delivery again. And a variety of access devices used with the focus being on the TV set in this regard.

And I'm not going to spend a lot of time, unless I get questions from you, going into specific definitions of these various terms. It gets too confusing. And I'm trying to maintain, although many of you will probably disagree, that that's not too important to understand each of these individual technologies, it's too confusing. And some are here today and gone tomorrow, and by the time you learn what it means, what does it really matter. What's important is to focus on the software and how the people are being compensated for getting that new good piece of entertainment to the user.

Yes, please. Just speak out.

RESPONSE FROM AUDIENCE. Do you have the slides you're showing us in print form?

Mr. GAFFNER. That's a good idea. David, I'd be happy to pull these together later on. We could do that. On most of these slides, we—excellent question. Yes, we could provide—I think there would be about 40, 50 slides that would help you later on in breaking these out.

Now, these are—oh, I'm sorry, yes.

RESPONSE FROM AUDIENCE. Any possibility you can go back to that distribution slide? You went through it so fast, it was really helpful.

Mr. GAFFNER. I am paid to sometimes make remarks that people don't like to hear. But let's face it, a lot of the communications, the ones that involved on-line telecon, they haven't done as well as the physical stuff that's been able to move through the system in a cassette form or a diskette and then be used locally by the person who has a VCR or a PC without any tie to communications. And believe me, our whole company is built on watching the various communication technologies. But some of the real winners in this are the software that you plug in and get from a local store. So you cannot forget physical distribution as part of these scene. And that's really the success of the personal computer industry, is that they saw this and they exploited it.

So since the personal computer is a major part of the discussion going on here, and one of the toughest areas to protect, the piracy of software, I picked two slides out, just up front, to show you that the same way of looking at it from author to user, even though we're not talking here about an electronic distribution system,

we're talking about physical distribution, occurs. The author creates the software and it's very much like, as many people have said, book publishing. And you'll be hearing from book publishers in the 48 hours. It moves through the channels to the distributor to the retail stores, or other ways to the user.

And the primary area of creativity that has made the PC software area boom, for instance, is really in the distribution outlet, even more so than in the creation of the basic products. You've got thousands of programs, but some of the ones that are most successful have been those that had good marketing. And to figure it out, you had to use a lot of channels of distribution to get it out to the user, physical channels of distribution. And maybe some of the best software products might not even be known because they never got into the distribution channel. Like we're going to see about Plato later on.

Now, Plato, as everybody knows, from Control Data, invested a billion dollars in trying to deliver it all electronically. But now they're coming around, and we're going to see a demo on how it can be delivered in a physical form. But the problem is, when you put it on a TV set, they all look the same.

Now, somebody might pick this apart, but I know you're concerned with these areas. This is from our research in the marketplace, shows how a personal computer software, the money is divided between the authors, distributors, publishers and retail store.

Again, no electronic distribution involved in the booming PC software business. But common characteristics, again, is part of the whole same arena. Now, here's a slide we just created a month ago, because now, with the breakup of AT&T, there is so much emphasis on all of the new communications markets. Cellular radio, paging, things we didn't even hear about a year ago. Side band, vertical blanking intervals. Satellite has been with us a long time.

Now, I maintain once again, you could try to learn all of these, and maybe you can have people on your staff who could learn what all these mean. I don't really think they're important for the challenge to you. You have to concern yourself with what's on the left here, what the information provider creates is going to go through this same transmission scheme. It's going to have a terminal and an access device, CRT meaning a cathode ray terminal, PC meaning personal computer, obviously.

Now, a new problem you face, however, is in the last one on the right, the storage, because this is where the user, as David Ladd pointed out in his excellent writeup in October '83 that was mailed to us, that now the user can store this so cheaply, you can make decisions to copy music. Now, you wouldn't care if your kid copied Michael Jackson singing "Thriller." But what about copying a movie? Well, the court right now says, okay, you can copy a movie. But then, how about copying data bases on your personal computer and then storing it locally? Nobody is paid royalties to create a data base, et cetera.

So there is so much new evolution going on in technologies and how to store this at your local access point and take it down, down load it. You'll keep hearing about downloading. That gets very complex. And again, I sympathize with the challenge you have

ahead, but you have to focus again on what's on the left and how the user uses it on the right, and not too much in between.

Now, just taking a slide of the on-line data base industry. This is Mead Data, Lexis, the New York Times information bank, Dun & Bradstreet credit information on line. We've all heard about these on-line data bases. The Medline from the department of medicine. The government has many data bases.

But look at these same principles. Somebody creates the data base; somebody then distributes it through a transmission network to the user. We're just trying to get an overview of how this whole arena works. Or take videotext, which we've heard all about. Now, this is the slide that shows AT&T's master plan that was fought and challenged and then—gosh, I can't remember if it was—then the government decided AT&T could not go into electronic publishing for seven years.

Well, the Bell operating companies and others are now looking at how they can get into this somewhat; you'll hear more about it. But in effect, if you'll look over to this case on the right, there is where you have all the intellectual property created. And then it flows through the—in this case, AT&T's system. And you don't have to worry about that middle point, to the terminal. And there's a lot of evolution, all kinds of new terminals that are going to be coming out, that are going to be—come in your kitchen, they're going to enable you to access a videotext separate from your TV set. All that change in terminals again shouldn't have to concern you too much, I maintain.

Now, this talks about conveyance.

But this shows that a range of electronic information services shown across the top are really brought together through this videotext type of distribution system, or through the personal computer. And they become transparent. And that's really an area with which you don't have to concern yourself, because you're really thinking about the person that creates the information that goes back behind those top area services. But it's one of the complexities that keeps coming up in your challenge.

In 1985, unbelievably for the first time, a shipment of personal computers in magnitude will be greater than mainstream computers which have been around for 30 years and that have built the whole computer industry. And that's only a year away.

The problem is, if you're watching this personal computer industry, look, Commodore just finishes its best year, and the chairman quits, the president quits. And suddenly the next week, everybody says Commodore is going to hell, after they just beat everybody out, beats the pants off them. The journalists come out and say Commodore doesn't have any future right now. I don't understand why they say that, just because four people left. They've reached a billion dollars in about five years. Take Texas Instruments. They were able to lose $800 million or something in one or two years in the personal computer business. Talk about the revolutionary dynamic forces beyond our control.

And we who are not stockbrokers—finally, Texas Instruments says, we're getting out of the personal computer industry, and the stock goes up 50 points. It's hard to understand. You'd think if

somebody admitted a huge failure the stock would go down 50 points. [Laughter.]

Or take Lisa. Lisa didn't really go anywhere. But how much do you read about Lisa? Well, now they say that John Scully and everybody out at Apple are betting their whole company. And Steven Jobs, he's got a billion dollars in the bank, he's betting it all on McIntosh. Well, why is he doing that when Lisa didn't work? I don't know, but everybody says, Lisa is revolutionary, it's going to change. And we'll ask the people over at IBM on Monday what they think about McIntosh. But where will McIntosh be a year from now?

Or take Atari. Here's Warner Communications and Rupert Murdoch and all this confusion, and one billion dollars in losses. And they're trying to start a Atari tell, and the PC in the home is going nowhere, and along comes IBM and McIntosh saying, we're going into the home where Atari has been for four years and lost a billion dollars.

The rules are not there. They are not there, and that makes it very complex. And again, you really can't follow all those week by week, month by month changes that will continue. You've got to focus again on how to protect the guy who creates the software.

You're going to have 16 million of these devices at a minimum out in the hands of users—that's the only point of this slide—by 1986, and possibly most of you will have them in your offices and homes by then. This is true. That's why you face such a challenge.

And this was already alluded to. The younger people understand it a lot better than we do in many cases. But talk about mass distribution of computer technology, it's happening. But remember that—stay behind that cutting edge blade. That's the problem you face, as you know. As it all moves out there, a lot of it doesn't work.

So this gives you just a few quick slides. And let's just take a profile based on our survey. Here's the typical corporate user of a PC on his desk. But this is just right now, because it's going to be all of us within three to four years.

And here's the typical home user. Yes, question, good.

RESPONSE FROM AUDIENCE. [Inaudible.]

Mr. GAFFNER. They now are coming out with a new attractive packaging to encourage females to buy. [Laughter.]

I totally agree with you. How many—there's no doubt that from the surveys, unfortunately, the PC at this point in time is one of those few areas left for male domination. [Laughter.]

I'd rather not get hung up on the feminism problem on this, but I brought it into my own home and my son and I used it, and my daughter didn't like it, walked away from it.

Yes.

RESPONSE FROM AUDIENCE. I'm going to try to bail you out. [Laughter.]

May I suggest that the main purpose here of course is our conversations together. But please, when you speak, just give your name. You don't have to give your organization. So later on, when we use the videotape—and I've changed the subject.

Mr. GAFFNER. Oh, I see. Because of the videotape, that's why they want it. Please.

RESPONSE FROM AUDIENCE. To raise a gender neutral question, there's one concept that's central to much of what you've talked about, but which I've seen described in perhaps a half a dozen different ways in the literature. The microprocessor. Can you describe briefly a unitary meaning of that?

Mr. GAFFNER. Yeah. I was hoping somebody would ask that. But I—in the early years, what was the difference between a PC and a microprocessor? Well, a microprocessor is really the electronic kit that does the job, and the personal computer is when you put it all together into the machine, and what makes it work in the system. But that's a good question. And the terms micro and personal computer are used synonymously. Micro does not mean any longer microprocessor, like it did before. We don't really hear the term microprocessor used with that electronic chip very much. And really, it's the electronic chip that's behind all of this change, really. It's what's going to make your telephone smarter, et cetera.

That's a perfect question. I hope we'll get more like that. Yes.

Okay. Yeah, no, mainframes are computers used in computer centers, in a company or a government office or a school. And they're primarily run to process data at that site, and then sent back to the user, often in printout form, or you might have a terminal, which is not a personal computer, that accesses the mainframe computer. And that's what the whole industry was built upon.

Now, the personal computer is a decentralized personal device that you use at your desk or work station, or in your home. Well, one other way—personal computers are generally ten thousand dollars and under, and mainframes are really $200,000 and up.

I totally agree with you. That's the way the computer industry is going. And we'll have discussions on that tomorrow. And that's why companies like NCR, Burroughs, UNIVAC, Control Data and others that did not go fast into PCs are very worried, because really, you only had two majors, IBM and Digital Equipment. going early into the PC, and Wang. But the others lagged behind, and so therefore their main market is evaporating and you've asking the question that many people are, including the people who run computer centers. Why should I stick with this big clunk and spend all that money?

But there are a number of reasons why we don't have to get into that today; both industries will continue to flourish. Again, this is just the results of our independent survey, I'm reporting the results, that there is no doubt that—when you take to these earlier—it doesn't mean that in five years it will all change. By the time you make your law, it has to be a law obviously for everybody.

Yeah.

RESPONSE FROM AUDIENCE. When you use the term electronic interface, are you using it synonymously with semiconductor chip and micro electronic chip? Do those all mean the same thing?

Mr. GAFFNER. I heard the last part, not the first part.

AUDIENCE. The term electronic chip.

Mr. GAFFNER. Yes, I'm using them all synonymously.

AUDIENCE. For semiconductor chip?

Mr. GAFFNER. Right, yes.

AUDIENCE. Okay.

Mr. GAFFNER. The specific applications or functions today, and more and more functions are being created monthly. Again, I will be getting these slides to you, so I will make a certain point on a certain slide and then kind of move on before you have time to study it all.

This simply shows that the size of a PC software market alone in 1987 will be about seven and a half billion dollars. We predict that the on line data base business then will be about three billion dollars. It shows that both of them were at about $100 million in size last year; they're growing at a tremendous pace. Sorry, at one billion dollars size in 1983.

Now, this gets into the problem that you face. There are so many producers of these software devices, unlike the video software industry, that PC software has lent itself to thousands and thousands of authors. And one of the problems facing book publishers is, how to sort out the good from the bad. Of course, you have all these youngsters making enormous profits. They're the ones that are protected, but they're the ones that are making the industry grow.

And as I said, this slide just merely shows that unlike most of the new technologies, they came up with the concept of a variety of different channels of distribution, which really made the industry take off in a very short period of time.

This simply shows that a number of book companies are getting in. I wouldn't bother looking at the details of it, but these are just other channels of distribution book companies are using. The point here is that initially, you could look at a list of the 50 top software producers, and they were all unknown names. And some of them have become important names today.

Then the big companies are now moving in, and we have people from those companies here with us.

RESPONSE FROM AUDIENCE. You may have said this before when I was out of the room. What is a systems house?

Mr. GAFFNER. Again, it's a computer industry term where they take a personal computer and they devise a software package for it that does a certain application, like they handle problems in a medical office, or that you might have—in your Congressional office. You might have a software systems house come in and devise software for it. But it's not a very important part of the problem you face.

It's really tailored software packages, is a systems house.

AUDIENCE. Okay. The next two arrows—I think this is minor, but the distributors in retail stores are a part of the same channel.

Mr. GAFFNER. Distributors refer to wholesalers. The wholesalers who take it from the manufacturer and then move it to the point where the retail stores take over. They're part of the same channel.

AUDIENCE. Okay. And what is this ambiguous term over on the right, emerging——

Mr. GAFFNER. Well, they have Tupperware parties where the ladies will go out and sell it locally. Where Chase Bank is now selling software of all types to users in their home. And E.F. Hutton, the stockbroker, they're selling four different types of—their registered representatives are selling four different types of personal computers and the software to go along with it.

These channels are just coming out everywhere, because everybody believes that books used to play the primary role, or network television that, more and more, in five years that PC software will be an increasingly important aspect of our lives.

So. Done with PCs, let's go on with—when we're done here today, one of the areas we're going to look at is the video area, broadcast, cable, satellite, home information, home entertainment information systems.

Okay, so again, you're going to hear about a lot of different technologies. You've heard about them, it's not too important, I think, to learn about what each of them means. They're all competing and will eat up each other as time goes on, and they'll all take away broadcasting.

And here's another way of looking at it. Why go through and tell you what all those acronyms are. You can read about them in all the publications in the trade. But they all enable a video program, largely, let's think of entertainment, or Plato software. These are all ways that you can move this creative video, the software you have to concern yourself with over here to the user. Don't get caught up in the turmoil in between.

Broadcast satellite, which the journalists love, which we happen to think is not going very far very fast. And the other two are also just transient technologies, multipoint distribution system and subscription TV. They're here for awhile, but they won't be that important.

But again, the problem with learning what one of them is, is that it can be gone. Yes, sir.

Mr. KASTENMEIER. Following up on that, I do think it is important, not that you should take time at this point to explain. But I will say that members of Congress, whether they're members of the Commerce Committee or our committee on intellectual property, you need to know what each one of those—the theory behind each one of those. Because they are all part of various legislative proposals one way or the other.

And it isn't enough to say that we should be interested primarily in creation of material. We also have to learn about all the rest, the method and the usage. In this connection, may I advert to earlier—you mentioned the term convergence, even as the last slide devoted itself to multiple channel distribution.

Is this an example of convergence, that is to say, where you have multiple—multiplying methods that converge on a single—ultimately single terminal, whether that is a television set or a personal home computer? Or what is the term convergence?

Mr. GAFFNER. Okay, first point. It's very important; the boss has spoken. So take these 48 hours to learn those. I was trying to be somewhat simplistic, and I apologize for that. And I'm glad you spoke up, because that's why you have all these demos here.

So God bless you, if you can learn all of these, I think it's terrific. All I was trying to say is, if you only have—and sometimes, I know there are some five or ten people that are going to be responsible for these laws that weren't able to make it to this symposium, they're going to have an even harder time. If you can only focus some time, I meant, look at both ends of it and don't get too caught up in the middle.

But thank you for correcting that point.

Now, convergence, this really shows a variety of different types of video distribution systems that the user, when it comes out as Star Wars on his screen, are—could all be done the same way. In other words, Star Wars could really be delivered in any of those ways to the user's screen.

So it just shows the variety of different delivery systems that you have to contend with. And I will now refrain from saying, don't learn them. But that you've got to try and learn. And that of these, at any one time, I guess what's important is to, at any one month—because it's not only a year. You have to know which ones are the two or three most important ones to concentrate on, okay? Remember low power TV and all the talk in Washington, all the licenses. What if you had spent a few hours a day learning what LPTV is and it's gone nowhere? I don't know how much time you have to look at them.

AUDIENCE. Well, I know that you cannot possibly devote yourself to an explanation of each, and that wasn't the purpose. But it is the case that each of these commonly is the subject of some sort of Congressional inquiry at some point in time.

Mr. GAFFNER. Yeah, and lobby groups. I know, it's tough. So I think, as much as possible, learn them.

Now, what is convergence? Convergence is usually taught, when you have the computer industry coming from here, the TV industry coming at it from here, the consumer electronic industry from here, all aimed at providing the same type of application to the user, and then all coming together at the TV set, and a variety of technologies are accomplishing the same thing.

Like, take videotext which we've heard about, delivering text information over the screen. Much of that has been the rug pulled out from under because the personal computer came along and delivered the same thing in software. So now, today, you look at somebody selling a videotext system, and you see a piece of PC software that isn't even—and they look like they're doing the same thing for you.

That's the convergence of all these technologies that's occurring.

Mr. HARTIGAN. Haynes, John Hartigan from Sony. I was just going to suggest that you might want to redesign your slides slightly in the area of video cassettes, video disks, because they are not only part of the delivery system, but they're the end product.

Mr. GAFFNER. Right. You could do that.

AUDIENCE. Can I ask a question? Is the point of this the transience and ephemeral nature of these different intermediate technologies? I'm not quite clear what the main point is on these particular slides.

Mr. GAFFNER. Okay, one of the ways to look at it is, there are a number of ways to skin a cat. That's all it's saying.

Now, what are the implications of that? There's only so much capital in America that can be invested in each of these new technologies. So the ones that get the most capital are liable to be the ones that are—that you hear about the most. It doesn't necessarily mean that they do the best job of delivering Star Wars to the consumer at the best price.

Another point is that with so many different ways of skinning a cat, you are going to have a number of these that are transient and that will discontinue. Because first, you had MBS and then you had multichannel MBS, and it just goes on and on and on.

And to follow these and try and figure out where they're going to—what they're going to accomplish becomes a very difficult task. So in a sense I'm agreeing with the whole purpose of this 48 hours, and this is intended to show the complexity of what you face.

And one of the problems, I would submit, is that if you take the time to learn each technology and as you're about to maybe pass a law—I don't know how laws are passed, and then a new technology came out to which you were going to go in and talk about it, that changed everything, where are you going to be?

So that, I think that too much focus on the individual channels can destroy the concept of what you have to aim yourselves toward. But again, I'm not a policymaker at all; I'm only speaking from a commercial viewpoint.

Yes, sir.

AUDIENCE. I think, following up on Congressman Kastenmeier, why it's important to look at the different technologies, and what you mean by convergence, I've understood it in a slightly different way.

For example, you can't simply think of the telephone as a voice—a telephone can also deliver a TV signal or it can deliver text. And the same thing can be said for a cable. It can deliver text, it can deliver different kinds of applications. That's what we mean by convergence.

The reason why Congress has to focus on the convergence is that each of those areas are regulated in a different way. Publishing is regulated one way, yet if the telephone is publishing and is being regulated by the government in another way, as common carrier, convergence is destroying the regulatory boundaries and the way that public policy has been built around these different mediums.

And the second reason why you have to understand this area in the middle is that, copyright, just in the area of copyright, while you're trying to protect the intellectual property over here, many of the economic forces in the middle here are owners of the software program. There's a convergence of ownership across this spectrum.

So there are a lot of questions about when you offer copyright protection, you're giving control. Are you giving control to the author or are you giving control to network television or a cable system?

Mr. GAFFNER. I think your point is very well taken, and it's the problem of trying to do an overview. And probably I should just stick to doing the overview and not make any points about what's trying to be done with the overview.

The main reason that you have the 48 hours, and that after I'm finished, you go on to the hands-on demonstrations in each of these areas, is to accomplish exactly what you wanted. And Congressman Kastenmeier wanted, and that is, to be sure that you do understand these as much as possible.

My job though is to provide a few simple guidelines to some people as to the relative importance of some of this field. Because

with 35 people at LINK, we certainly can't keep up with it all ourselves, and we spend a hundred percent of our time on it.

So that's the only point I'm trying to make, is that a few simple guidelines, but that, yes, you have to learn these. And that's why you're all here.

AUDIENCE. I think you have another problem as well. Since we're dealing in an area now trying to define computer crime. And we have some statutes on the books, both at the federal and state levels, which computers have been identified. That technology is only a few years old, and yet the computer crime statutes don't apply any longer to much of the new technology. And we are now searching for ways to legally define what a computer is.

Now, you talk about personal computers, you're talking about the delivery of text and other things, where if you're using those computers are basically arithmetic devices.

Mr. GAFFNER. Right.

AUDIENCE. And it's a whole new ballgame. And unless you can anticipate to some degree all of the various technologies which are coming on line, and talking in broad general terms, and describe as much as you can under the umbrella of the law, what will happen is, the new technology will come along, not fit precisely according to some court, in the definition of what you've done. And you have a whole new aspect to go back and change the law with, again.

And that's what we're facing now.

Mr. GAFFNER. Thank you. I must say in that regard that I found again, the yellow publication of David Ladd—was that sent out to everybody, Michael?

What he tries to say there, and correct me if I'm wrong, but he tries to say we must transcend these various changing technologies into a solution to this problem, that won't have to have happen what you describe.

And I would hope that might be distributed. Granted that the whole piece is important to these people, because it was written for a different body. But the part that talks about the problems that I'm discussing, and how you have to transcend that in a solution so you don't keep having to go back and look at a new technology, I think is very important.

And that's really probably all I'm trying to say. But I will move on.

These are various video software services that are created. These are pieces of intellectual property. There's a great amount of innovation going into this area. However, remember that much of this was talked about four or five years ago before the PC software industy even started. So the video software industry, all that original programming for cable never really happened. Maybe one of the reasons is that PC came in so fast and grew so rapidly, and that the VCR machine is primarily used to look at movies that you rent at the local store.

Anyway, this is still an industry that you have to consider, and it will keep growing. These are some of the types of suppliers of video software.

Now, again, notice the common characteristics, when we get into video software. Very similar to the chart I showed you on the personal computer software. And even though we've talking here pri-

marily about physicial distribution of this software for people to use in there VCR, it's also—video software is also of course broadcast over cable systems and network.

Yes.

AUDIENCE. I think you said earlier on that the physical distribution methods have been more successful than the electronic distribution methods in both video and personal computer software. Do you anticipate that that trend will continue?

Mr. GAFFNER. That's a very good question. It really hinges very much on the problem you people face. And what has happened is that because of the success of the distribution physically of video and personal computer software, people have come up with new ways to download it.

Now, these ways of downloading it become a new type of mass piracy. And that's really the success of it.

AUDIENCE. Can I interrupt just to ask what you mean by downloading? That's something I don't have any idea what you've talking about.

Mr. GAFFNER. Thank you very much. [Laughter.]

Michael? Michael left, but David, I might run a little longer, but I think that some of this does help set the stage for the 48 hours, I would hope. And if anybody disagrees with my definitions who are people are here to help us define these matters, tell me.

But in a simple term, if Star Wars is shown on NBC as a movie, and you record it on your VCR, in a sense it's been downloaded to your VCR. That's one simple way of—in fact it's a new term. Okay, you recorded it, but it's been downloaded.

AUDIENCE. It then is synonymous with copying?

Mr. GAFFNER. Yes, yes, yes. [Laughter.]

AUDIENCE. Why then do we use different terms?

Mr. GAFFNER. Okay. The same reason that the term downloaded has come up is that copying, as I gave a simple definition—but now you have two commercial schemes, whereby two people will get hold of a piece of software, either video or personal computer. And then through a pricing arrangement with a person who has the VCR device with a decoder or a personal computer with a decoder, they will download it on a one time basis. And a fee arrangement is involved in it.

This has great danger to hurting the people who created the intellectual property, unless their rights are respected vis a vis the people who are doing the downloading. This is also true in the data base field, where you now have a personal computer, you can sign on to a data base and instead of paying the normal royalties, you can pull that data base down onto your personal computer and store it locally. Use it as you wish locally without paying the royalties.

Chris, do you want to say something?

Mr. BURNS. My name is Chris Burns, and I hope this mike is working.

Mr. GAFFNER. Yes, it is.

Mr. BURNS. The downloading phrase really applies to the people who sign on to a data base. If you think of a data base of all the soft places of the last five years, and you sign on for 50 dollars an hour, you can get your stock prices or the changing current values

for any sector of the economy. What some people do is conduct a search of that data base, and normally, the data base publisher expects you to be looking at this data on the screen as it responds to your search.

But what downloaders do is record the data as it comes over the screen. They record it into their own private data base so that the next time they want to search the data base, they don't have to sign on again.

AUDIENCE. What does downloading add to the concept of copying? It seems to me it would be more intelligible if we use that word, isn't it?

Mr. GAFFNER. Well, it is—copying is done on a mass basis, and downloading is generally done on a kind of a point to point basis. That is, somebody has an arrangement and then it is released, and a monthly fee is paid.

But I agree totally with what Chris just said, that it is broader than that also, because it happens in the video software field, in the new ABC telefirst project in Chicago, which is the first time you have—wait, IDAC, right, is going to talk about downloading also of software.

Mr. LEONARD. It's basically putting enough intelligence in the receiving unit, where the actual copying occurs, and where the reproduction occurs, so that you can begin to get legislative control of it.

Mr. GAFFNER. Gene, good point. Gene is going to be in the whole demonstration on downloading here at IDAC. And virtually every one of the demos that you will see today can do a certain amount of downloading.

But remember, it is more than copying, because it has to do with the pricing arrangements. Copying, you ususally think of doing free. But this, there is definitely a pricing arrangement. And the problem isn't getting the money from the person organization that's downloading, to getting that money into the hands of the creator of the intellectual poverty.

AUDIENCE. Can I just say, I think some of us are confused, but I think that downloading may be slightly different than copying, in the sense that you pay for the right to have this brought up on your own personal screen.

Mr. GAFFNER. Yes, thank you.

AUDIENCE. At that point in time, you have it there. You have in effect copied it. When you bring it into your own data base on a permanent basis, you really still haven't copied it because it already was there. It's a very legal technicality which prevents us from enforcing some of our laws.

Mr. GAFFNER. You're right, you're right.

AUDIENCE. You still haven't copied it, because it was sent to you legally.

Mr. GAFFNER. Yes.

AUDIENCE. You've just retained it. Rather than copying it, you haven't reproduced it, you've just retained it. Now, the situation occurs that when you reuse it again, all you transmit that simultaneously or thereafter to somebody who uses it off your base, you copied it. That is really—and I think downloading presupposes secondary use—I'm sorry, copying presupposes a secondary use or the simultaneous rebroadcast somewhere else, whereas downloading in

essence is the taking of that material which was sent to you appropriately, and keeping it, instead of just shutting it off and having a blank screen, theoretically then returning it back to the original sender.

That's what I think——

AUDIENCE. I apologize for having asked the question. [Laughter.]

Mr. GAFFNER. It's one of the areas that comes up. I don't care if you're involved in a group of people who spend all of their careers in the industry. This is constantly today having to be defined. So I think you were very correct in asking it now, because you will hear a lot about it in the next 48 hours.

But the worst aspect of it is, it's going to be one of the complexities or toughest areas that you face in your reasoning.

AUDIENCE. But we have to stop thinking about the prior contact between a publisher and an ultimate user. And we have to assume that electronics and what not gives us the capability of arranging individual relationships, contractual relationships, which can be monitored.

Mr. GAFFNER. Toni?

Ms. BEARMAN. I'm Toni Bearman from the National Commission. One of the important points about the difference between downloading and copying is the type of use made of downloaded files. In many cases, they are integrated with other information that maybe we put into different numeric data, that may be integrated with reprint files that the individual has. But they're used frequently more than one time, and integrated with personal data bases as well.

So I think it's another dimension of the complexity.

Mr. GAFFNER. Thank you. And you'll have a lot of chance to learn more about that in the demos. I'm just going to give you a couple of forecasts.

This just shows that the video cassette recorder has to be one of the most exciting new devices ever created for the use of individuals. It almost should have that same glorious definition that I gave earlier about the personal computer: it really does change the way of life in a family, if you think about it in your own home.

And it will continue to grow. I think its growth is in the early stages.

Mr. MCIRVINE. I'd like just to break in here to follow up on that most recent remark. This is Ted McIrvine from Xerox.

The one element that looms large, I think, in the aspect of copyrights that hasn't been touched on, and that is not only protection of the rights of an author in terms of compensation, but also the rights of the author in terms of the protection of the integrity of that which he has created.

And the reference that was just made about the use of downloaded material I think touches right on this. That is, anything that is provided in an electronic medium is therefore subject much more easily to modification, and by that modification perhaps a dilution of what the author originally intended.

That's another aspect of the copyright problem.

Mr. GAFFNER. I can see two years from now having a symposium alone on downloading. That's a problem, because it does transcend both data bases, it's in the soft in virtually all of these areas. And

your question earlier about—about the problems of physical—the future of physical delivery started this.

The easy answer to that would have been, yes, physical delivery will grow increasingly, along with communications. However, it's this downloading that could affect that. Guess we better move on.

This just shows some of the VCR companies. Now, we've heard enough about the VCR. This is an older survey but we don't think this has changed very much. If you look at the main use of the video cassette recorder, it's still what they call time switch. That is, for the convenience of the family, these ratios haven't changed very much over the years. I know this has been brought out in all the Betamax talk.

The disk, we will see some of it.

Okay, but that other one, it's only point was that it really—okay, I'll leave it on. I just concluded this slide because of the Sony case. These ratios pretty much hold up. And that will be included in the slides that we send to you.

You hear a lot about the video disk. We'll hear about the disk being used as a storage device this afternoon.

In the entertainment area, the disk has been unfortunately not as successful at all as people had anticipated. We're going to hear also this morning about compact disks or digital audio, a very exciting new development in the recreation of music using a lot of the same technology that comes out of the video disk.

AUDIENCE. Can I ask a question? Video disk recorder is one of the bigger bombs of the electronic industry over the last few years. But now with the advent of—what do they call that, video rock or those——

Mr. GAFFNER. MTV's.

AUDIENCE. MTV and whatever, now they're putting them on the disc, are generally tended to be cheaper than tape.

Do you foresee those disk players coming back?

Mr. GAFFNER. No. I see the MTV type of video rock being still more on some type of a cassette delivery, because there's not enough disk players. Here's our forecast. The bottom one shows the growth of disk players. There are just not enough disk players out there to make it worthwhile for the software producers to put it in disk form. So it will be more in cassette form.

This shows your—the yellow is the TV home, and you can see, rather slow growth really, when you think about it, the blue being the cable converter in the home, and the much more rapid growth of the VCR device, and little growth in the disk.

AUDIENCE. Is the quality better on the disk than it is on the tape?

Mr. GAFFNER. Today. But with all the money being made by the companies in the tape area, it's being put back into technology, and that will continue to improve. We're going to hear a compact disk. But one of the reasons they say the compact disk may be ready is because of the Walkman. Just follows Dr. Boorstin's comments about the cumulative effect.

We all had stereo in our home. And then along came the Walkman and we all listened to it like this, and so we now upgraded our expectations for what we want to hear. And now that paves the way for compact disk, which we're going to hear about.

So I think that the cassette will continue to improve.

So the main point here—yes, please.

AUDIENCE. I'd just like to make two quick observations about the disk. One is that it's growing at a very high rate, as you can see on your graph. About the same as video cassettes, a little bit less, approximately three times over that same period.

Second of all, it's now being connected to the personal computer. And when thought of in applications as a peripheral device, and a storage medium for digital information as well as video, I think you're going to see a big change in that point of view that was just taken about the lack of success of the disc.

Mr. GAFFNER. Lack of success of the disk, like he said, is primarily aimed at the RCA disk effort and the Pioneer. Those have not paid off. We're seeing new applications of the disk this afternoon and in the demos here.

This effectively shows the problems cable has and the relatively slow growth ahead, albeit it's still one of the great successful industries if you look over the 50 years in America. But it is being impacted by these other technologies.

These of course are some of the leading cable system owners. We have a variety of methods for delivery of cable, and we're going to be getting into satellite shortly. And remember that cable is a transmission system as opposed to a creator of the software.

AUDIENCE. I don't understand that. What are you trying to show us? The various kinds of input in the CATV systems as a source of programming?

Mr. GAFFNER. The various ways that the cable head end can receive programming to play to the user the cable system being, again, getting back to the national versus the local delivery system.

Again, the point on cable is that we hear so much about cable. It is a transmission system, it is not the ultimate equipment device, nor is it involved in the production of the software.

AUDIENCE. Okay, but on the lower lefthard side where you have cable syndicator, what do you mean there? Cable networks? Like CNN?

Mr. GAFFNER. Yes.

AUDIENCE. And right below that, what do you mean by U.S. Mail, that you mail prints?

Mr. GAFFNER. Or that you can mail a videocassette to a local player. It's just various ways that the cable companies get their programming.

But the big breakthrough was in '74, of course, when the satellite came along. The satellite is what really sparked a whole range of new developments in the cable arena, and that's what brought about all of these various pay services.

But remember, the satellite as you hear about it is a national or international delivery system which then is fed into local delivery systems. But it's changed the whole dimensions of the copyright and technology problems, and made cable the industry that it is today, and created all of these new types of networks, that bring you a variety of programminng on a national basis. And in effect, these networks compete very much with the VCR programming, the disk programming. They're part of the same spectrum.

AUDIENCE. Wait a minute, go back to this. What is the difference between paying units and paying households?

Mr. GAFFNER. I can give you an answer, but I think we've got one of the world experts in all of this, who helped created it with us. So, Gus, why don't you give the answer to that?

Mr. HAUSER. Yes, the distinction is between households taking one pay service and those taking more than one pay service. And the cumulative effect of that in paid units, so that some households may take one or two pay units and some only one.

AUDIENCE. So if I'm taking at home Cinemax and HBO——

Mr. HAUSER. You've got two units.

AUDIENCE. You count that as two units, right?

Mr. HAUSER. Right.

AUDIENCE. I was interested in your comment that cable was growing slowly. I think maybe it's growing as fast as the cable operators can physically connect the customers, at a rate of about 350,000 to 400,000 subscribers a month.

And knowing the industry regards that as slow. They're having their teething problems in accomplishing that phenomenal growth as it is.

Mr. GAFFNER. There's no doubt about it. The cable industry by definition with the heavy infrastructure that has to be laid is not one that can grow possibly as fast as one like the personal computer industry that came from nowhere in three years and became the type of industry that it is.

The cable industry is something that will continue to grow through the rest of this century, and increasingly play an important part in our life, no doubt about it. This does show that the——

AUDIENCE. Can I follow up on that?

Mr. GAFFNER. Yes.

AUDIENCE. Isn't there a very big problem now because although the growth is going as fast as they can lay cables, isn't it a reality that with the advent of the satellite transmission, the ultimate necessity for cable TV is slowly reduced? Because many people in concert—for instance, right here in this area, new construction by home builders or condominium builders can in fact allow for the investment of sufficient capital to buy an earth station, bring down from satellite that which would have been provided by cable. And the people building the condomiums or large tract housing can in effect run their own companies. They no longer need cable to deliver the same services they can now get off the satellite by a small investment for an earth station, and wiring directly in their own complex.

Mr. GAFFNER. Right. That's called SMAT-V or SMAT TV or satellite master antenna TV. I'll have a slide on it in just a moment.

AUDIENCE. That's depressing ultimately the——

Mr. GAFFNER. Well, that is one of several technologies. LINK feel strongly that the cable industry—and Gus won't agree, probably, but this is why we're all here in this 48 hours is that the cable industry underestimated the impact of the videocassette recorder. I think once you buy a VCR in the home, there's less need any longer to have a cable set in your home.

And that's a very simplistic statement, but that's probably hurt the growth of cable more than all of the other competing technol-

ogies all along. And I point that out because again, the videocassette is a stand-alone device. It's a lot cheaper to run, you're not having to hook up cables. And after all, they're now experimenting with downloading over broadcast directly to your videocassette recorder without having to lay a cable.

But it is—you're right, there's a number of technologies that came along because of the cumulative effect Dr. Boorstin mentioned earlier.

AUDIENCE. I would just comment in broad perspective on that issue that after you look at all the competing technologies, and there are many, whether it's SMATV, satellite master antenna system or VCR or direct broadcast satellite, I think those in the cable industry feel very strongly that cable will compete very handsomely with all of the technologies, because after all it is the most efficient and most effective and widespread delivery system for information of all kinds.

I'll skip the details of all that.

Mr. GAFFNER. Right, and Gus will be on a panel tomorrow and he will be here—he's one of the pioneers in that industry for us to talk to during dinner, et cetera.

I'm going to go very fast. I'm going to have to wind up in two minutes. We are negative basically on the growth of direct broadcast satellite that you hear so much about. When you take all of the available market we see going way over to the right that there's only about seven percent of TV households in America that really become a viable user of direct broadcast satellite, despite all of the talk and billions of dollars that's going into it.

This is what our gentleman here talked about on an SMATV. This is a very good description of how he just described apartment houses can eat away at the local cable systems.

But cable systems in Virginia, where Media General is wiring Fairfax County, they're now going into this same business and are wiring apartment houses as part of their installation within a whole community. So I think the cable industry is overcoming that.

AUDIENCE. Speaking about apartment complexes, et cetera, the owners of the real property are refusing easement to lay the wire, because they want to run their own SMATV. And this is a situation that they anticipated [inaudible] and pay franchise fees and develop the areas, based on this. And now they're being hit with this kind of competition that they never anticipated. Now they're asking for relief.

Mr. GAFFNER. Right.

AUDIENCE. And it looks to me like this is a real case of unfair competition based upon the failure of an industry maybe even to physically anticipate.

Mr. GAFFNER. I totally agree with the problem. I'd rather not get into a discussion of it. I think it's very difficult, but hopefully during the course of the 48 hours we can get into more detail on that. And I would think tomorrow you would find the panel has to address themselves to your point. Very good point. And those are powerful lobby groups working on you, I know how it is.

Local cable systems are all coming together also, which makes it even more complex. I won't get into that, it's called cable interconnects.

This is kind of an overview then about the problem, as I come to a conclusion here on these various technologies, based on what cable faces today.

AUDIENCE. What is Telco competition?

Mr. GAFFNER. Telephone companies. I have a whole area that I'm going to skip. But one of the biggest problems we face, we don't all have to have one more time of Timothy Wirth and all of the battle over the last three of four years and the AT&T divestitute, you've heard enough about it.

But it has a major impact on this field that makes it even more complex because those individual seven companies plus AT&T are very, very powerful companies with a lot of clout, money, brains, technology, and they're going to be in fighting in this whole arena. And we just haven't even begun to hear about them yet.

But that's going to be—the telco's being another threat to the cable companies. Some of them are even trying to get into the cable business.

This slide simply goes back to that one simple rule of thinking about the local versus national distribution, and the local being the telephone lines and the coaxial cables and the national ways of distribution being satellite, microwave and fiber.

So I'm going to—as we look at that slide—now, this is a good slide to end on. That shows again the complexity that you have in these new communication arenas. This also shows the intercity or national that are involved, and the local loops.

And most of these technologies are either in one of those areas or another. That's another basic principle. And so I'd like to, as we look at this slide, just review again what sometimes has been a rather haphazard presentation, and it is far too simplistic for the complex decision making ahead for you.

Just the six points again, one of them being, make sure you understand the geographic mix of national versus local. It has a lot to do with how you look at each technology, that you basically are focusing on the software production, and in the middle areas you're looking at turmoil in the means of distribution and in the terminal device, the access device.

That's where the turmoil is going on, and where you have to keep track of each of those on their own. But as you do that, don't look at any one technology on its own. You have to see it as part of this whole mix of the new electronic media. And the final point then is that the convergence of all these technologies, and that convergence is often transparent. There's another complex point that you have to keep in mind, because many of the forces at work are aiming toward the same goals which converge in, say, one type of presentation on your screen.

Do you have a point? Yes.

AUDIENCE. Are these slides you've shown available in printed form?

Mr. GAFFNER. Not today, but I will be supplying them to David Ladd, and he will then send them on to the participants; he will know who they are. But at the same time, if any of you have a business card that you could give to me during the next two days, I will make sure that we mail those directly to you if you have that need. Just give that to me.

So in conclusion, on the convergence again, that's why we are all here. That's why we've converged for this 48 hours, is to come away with more than we came with and try to cut through some of this. And I hope that this is only an initiation of that process, this presentation this morning, and that as we go now into the hands-on demonstration by the various companies who have been kind enough to come here, that we will clear up even more of the confusion which addresses this whole field.

Thank you.

The first presenter will be Don Devine from Trilog.

INTRODUCTIONS TO DEMONSTRATIONS

Mr. DEVINE. Good morning, folks. We're going to do a demonstration that relates to computer programs. Now, that's the kind of software which is a little different than some other software that we've been talking about here this morning, in that it's aimed not at human beings, not to educate or not to please a human being, but it's aimed at instructing a computer, a machine, in how to do work. That work might be to run a game or it might be to run a spread sheet or do an accounting system. But yet, it's work.

And so the key item here is the computer software is an engine for improving productivity in America. The computers are worthless without the software. And it may be one of the most important things for us to face up to, how are we going to make computers able to help us improve productivity in America in the next decade.

In order to do that, we're going to have to make sure the people are profitably rewarded and encouraged to build computer software, which means they need a certain amount of protection.

If any of you have children who are 11 or 12 or 13 years old, who are nieces or nephews or grandchildren, there is probably someone in your family actively engaged in software piracy.

Now, that may sound like a terrible indictment. I'm a leader of a Boy Scout troop, and after the Scout meeting one night, I saw these boys over in a corner, just getting together, having a little bull session, talking to each other. And I went over and said, George, what's going on? And they were passing diskettes back and forth. And I asked what was happening. And they said, well, Charlie here, he buys all of the latest games for his Apple computer, and we all have Apple computers at home. So every week we give him a couple of blank diskettes and he copies these games for us.

This is an interesting dilemma for a Scoutmaster. [Laughter.]

It's an interesting dilemma for a Senator or a member of the House of Representatives who might find his own children or grandchildren or nieces or nephews illegally copying software.

The Betamax decision may have indicated that this is acceptable behavior if it takes place in the home. We are going to show you how easy it is to copy software, including that software in which the manufacturer has invested heavily to keep you from being able to copy the software. We're going to show you how you can go to a local computer store and buy a product for 50 dollars which will let you break the copy protection of almost any piece of software that exists.

We're going to show you a piece of software today, and we'll let you actually sit down at a computer and run it yourself, a piece of software that says, if we can't crack the code of some product that you bought, send it to us, we'll crack it and send it back to you within 30 days.

This is a serious problem of what is acceptable behavior. I'm concerned with it in the home. I'm more concerned with it in business, in the universities, in government, everywhere we're looking at productivity tools, we're looking at improvements in American productivity, and we're looking at building in America an outlook today which says it is acceptable behavior, piracy of software. When these guys move on and they start working for the big companies of America, they're going to continue to pirate software. So it's a major concern.

What we're going to do is, we're going to show you how it works and we'll be talking more about it in one of the panel discussions tomorrow.

Mr. GAFFNER. I've been asked again by the people running the system, if you have questions to identify yourself, because apparently the questions aren't being captured.

Our next speaker, or at least to introduce Bill Tauskey from Visicorp. Is Bill here? He's probably back in the demo room, because Visicorp is one of the early pioneers in the building of personal computer software or the publishing of it Visicorp now has a whole range of software on the market. And as you can see, his demonstration is going to be very useful in that regard, and a better understanding of the copying problem that a publisher of software faces.

I think that most people feel that the P.C. industry really started about four or five years ago, when the Apple computer came out along with Visicalc, which was the financial spread sheet, which was pioneered by Visicorp.

Next then is Pat Wilson from North American Phillips, one of the leaders in this whole area of home entertainment information centers. Pat?

Mr. WILSON. Just a quick rundown of what we're going to show and so forth. Before I do that, I think it's important to—before we tell you where we're at, is to just review quickly where consumer electronics has come from.

I think of the 20s, 30s, and 40s as the age of radio, the 50s as the age of black and white television, the 60s with the age of audio, the 70s is the age of video, video cassette recorders, solid state color television, the 80s, digital age emerges and the 90s, solid state digital recording, which is what we see coming.

Also, it's proper to say that all our companies are looking at the computer in the home, working at the marriage of the computer and the TV. I say the TV, but what I'm really saying is the audio video wall that we're going to demonstrate shortly after this meeting, and coming together with the computer. Those three items, we think, and we're working on, are going to change drastically the quality of life that we all see in our own homes.

Just looking back, the chunks of time, those decades when we measured progress in technology for consumer electronics, I'd like to just go back and look at product highlights from 1972 down to

today. And in 1972 you had the first home VCR, the first home video game. 1972 you had solid state color TV, giant screen projection TV. 1975, the CB radio, 1976 the first microprocessor video games, you had push button color TV toning. In 1977 the VCR market emerges, home color TV, VCR cameras are introduced and are a separate market from VCR. Personal computer market emerges. 1978, home projection TV established, home telephone market emerges, videodisk marketing begins. 1979, first home computer introduced. 1981, portable VCR cameras established as a new market. 1982, component TV systems, receivers and monitors make their entrance. Voice synthesis, talking products, talking microwave ovens, talking TV sets in the home. 1982, component color and voice synthesis. 1983, the compact disk which we're going to show you which is really the first digital, this little baby here, which is like a miniature version of the videodisk.

Our marketing people say that if you blew this—the pits that are encoded on just one side, if you blew it up the size of a football field, each pit would still be no larger than a grain of rice. Now, our colleague from Sony mentioned to us last night that every man, woman and child in the United States, their home address could be covered on a disk.

We'll be showing this and we'll let you play it and feel it and plate. Also, one of the things in 1983 are the high performance contact projection TV, which we'll show, liquid pool and so forth. Other developments in 1983 are these new cam corders, which are the combination VCR and cameras in one. I guess you might remember where Kodak introduced an 8-millimeter. There's also a Beta movie and another one, a VHF hifi which is coming on, and a VHS video movie.

In 1984 we see a whole generation of new picture tubes coming on that are going to change the look of the TV set. Projection TVs are going to change drastically and will be better than color TVs. Digital TV, digital everything is coming in 1984 and 1985.

I guess having had a little background in the commercial side of industry electronics, we used to talk in terms of the rate of change. I think today it's the rate of the rate of change. We've seen just by running through the background that things used to take decades, then they took years. Now they're taking months and we're seeing weeks.

And we've had examples where a product was introduced, and before it was actually in the marketplace it was obsolete. And that's the kind of things that we're seeing. In consumer electronics, I think we used to be at the tail end. We used to be the caboose of the train, and now we're no longer that. Technology has helped us come right straight from the R&D lab, right into the consumer field. We don't have to wait til industry gets ahold of it. It just doesn't happen that way anymore. It's occurring very, very rapidly.

And my colleague, Rich Hostler will be demonstrating the products, in the board room, Rich? In the boardroom down next to the G&C rooms. And if we can answer any questions at that time we'd be glad to. And if you'd like to come up and try any of the units yourself, you're more than welcome.

Mr. GAFFNER. Those three gentlemen represented, as you can see on the chart, the home computer and electonic entertainment sec-

tion. The second arena is broadcast cable and satellite, and I'd like to introduce first John Sabio from SAT TECU. We saw the large type of satellite dish receivers in one of the slides. These come at various sizes all the way down to those tiny ones that will go in the home. Here's John.

Mr. SABIO. Distinguished guests of honor, Congress, ladies and gentlemen. Due to remarkable advances in communication and recent laws, we have about 300 channels of television programming available to us, direct from satellite. With 100 channels 24 hours a day. That is, television programming, computer data, 150 radio stations, and telecommunications. I'd like to point out, a lot of hotels are getting into teleconferencing.

We have educational channels, music channels, sports networks, religious channels. There are four hospital networks now, most of the hospitals locally are getting into teleconferencing, and inhouse hospital networks for inhouse education.

We also do satellite master antenna systems for condominiums, where we install the complete system free of charge to the owners, and just become programming brokers. For example, we pay Home Box Office their royalties per month, on a unit basis.

I know at my home, I have cable and Home Box Office charges me approximately ten dollars per month for Home Box Office. That's paid through my cable company.

When we offer a system to a condominium, the unit owner would pay perhaps $3.75 to us per month. Of that $3.75 three dollars goes to Home Box Office, and the rest would go to cover the expenses of installing the equipment.

We're in the retail business, locally in Miami. And we have a lot of foreign trade from South America and the Caribbean. Most of the people that come into my store live overseas, have very little television programming, and will pay any royalties or copyrights just to be able to see the American satellites.

I personally believe that how much of better way can we actually show the rest of the world about our capitalist society free enterprise system, than through our satellite. I think we should make it legal for the rest of the world to see our satellite.

Thank you.

Mr. GAFFNER. John, being based through you, you are selling these satellite dishes here in the Miami area?

If any of you have been to the Caribbean during the winter, you'll see, as you go around some of those islands, they have a lot of these dishes.

Nobody is to blame in this, I'm not suggesting. But that's one of the problems that I've seen mentioned as you look at the copyright aspects. And a friend of mine in British television was hired by the Jamaican government to participate in the whole scale bringing in of the HBO, and broadcasting it right out to all of Jamaica from the satellites that they installed at the national Jamaican TV, with no payment even going to HBO, much less to the original copyright producers. And you can imagine what that does to the sale of American movies exported to Jamaica.

Do you have any comments on those problems, since you have a firsthand view here, or not?

Right, right, come up later. Thank you, John.

John did remind me of one item I wanted to include in my introductory remarks. And that is that despite the problems that we face and the complexities in this, the American system has really been wonderful when it comes to having a climate for the creation of these technologies. We have a lot of European clients and Japanese clients. And believe me, they are way behind because of the lack of good copyright laws or the implementation of those laws.

If you look at all of this area of the new media, the Japanese and European developers of systems, all look at bringing their systems to America and testing it out in our marketplace. So that, despite the fact that sometimes you worry about our problems and not keeping up, you're way ahead of the rest of the world. And maybe it's because of symposiums like this.

The next speaker is Bob Quinn from the NABU network. Six or seven years ago, Bob and I were involved in our first venture in the new media, where we were helping to demonstrate one of the systems that we've talked about today. Bob has a long history in bringing new technology to the public.

Mr. QUINN. Thank you, Haines, and good morning. Sometimes the people introduce you as bringing things to the public; it sounds a lot like pioneers. You all know the story about the pioneers, the people with the arrows in their back. I had a few in my back this morning. I'd been speaking this morning with Dr. Murphy, who's visited the demonstration room and doesn't want to leave. We will have a demonstration of what we're calling the NABU network after lunch. I'd like to tell you a few things about it this morning.

NABU is a company that in 1981 decided there was a business making communicating computers. The problem it sought to address was that the mass market was not buying personal computers essentially because of two problems. Number one, the box was expensive and required some technical expertise to run.

Worst case, once you understood the box, now you had to buy software. That was A, very expensive, B, at least bewildering to average Americans going to the computer store and saying, I would like a word processing package so that I can write my letters at home. It is never that simple a dialog, it's how much memory do you have, how fast do you want to run it, do you want to store it, do you want to put it on paper. And all of sudden, third sentence in the dialog, you've walked out of the store.

If you choose to stay, you spend a lot of money. Suffice it to say that the bottom line today, a typical American consumer who wants to buy a personal computer, can buy something off the shelf, a Commodore 64 computer routinely retails for less than 200 dollars today, and you have a box. It doesn't do anything, but you have a box.

You then go and buy the adapters that hook it into the telephone line, that's a 100 dollars. You can buy the storage devices, that's another 100 dollars. If you buy a printer you spend three more. Now you're ready to buy the software. Software runs anywhere 200 and 500 dollars, depending on the maker and what it does. That is not, I submit to you, a typical consumer purchase.

NABU's slice was, if we can eliminate all of the jargon, if we can eliminate the cost threshold, at least get it down to the point where it's an acceptable level—that means rental, incidentially, and pro-

vide a focus on the utility of the machine instead of the mechanics, then personal computing may be a mass market and there's a little money in everyone for that kind of a business.

There are essentially three pieces in the NABU concept. One is what we call the head-in computer or a data broadcast system, which stores 13 million bytes of software, and distributes that software to a cable operator's head-in computer, so that he can distribute that around a typical cable system to subscribers that have rented the system, or subscribe to them or to the service.

One of the interesting pieces is that it does not require a video quality channel for distribution. Every cable operator today has a fixed number of channels. Those of you in the Washington area—I live in Alexandria during the week—we've got 36 channels of nice video programming.

Well, there are also a good half dozen other channels that are unsuitable for video. The NABU network can ride on those channels because it delivers digital signal.

So one, it's a head-in pump that passes the signal around the cable on a channel that the cable operator designates.

The second critical piece is what we call a NABU adaptor, which is a box that goes in the home, it translates the signal that it hears over the cable so that the personal computer can hear it and use it.

Coincidentally, it also has a return capability. That adaptor in the box can be plugged into your telephone wire, so that conceptually you can receive a signal through the cable system. That signal may be, would you like to find out what Dow Jones says about the NABU stock today? You say yes, and the adapter then automatically dials, because it's received telephone number and computer sign-on code from the cable system, automatically dial the Dow Jones computer in Princeton or any other remote computer. And now presents itself as another telephone subscriber to those remote data bases.

The third piece is the service itself, the software that is spun around the system. And that is virtually anything that the seller of the service may sell. I think the things that sell fall in five kinds of categories. Number one is educational software. There is a bewildering array of general software, education software by itself is monumental. There are zillions of titles, some of them educate well, others run well in computers, there is very rarely a good road map through that forest.

But there is certainly a high demand among municipal and state officials at least, who pay through the local school system for quality education, computer-assisted education, at least in the primary and secondary levels. In Virginia and North and South Carolina, we're seeing a lot of activity on the community college level, where instead of adults going to a classroom once or twice a week for a class, you sign up for a class, you get a telephone modem and you get an Apple computer and you go home. The local cable service delivers software down to the computer, and the student sits there and takes the course.

For regulatory purposes, the state requirements, the student needs to meet periodically with the instructor so that there was in fact a class meeting. But the classroom activity happens in the computer system.

Number one is educational software. Another key ingredient is video games, simply because that's an enormous market. And it's the kind of software that's easily distributed, has a relatively short lifespan, so there's a constant demand for new titles. A simple hands-off delivery system seems to be effective for that.

Third is professional software, the reason most personal computer owners bought the box in the beginning. I'd like to do word processing in the home. I happen to have a financial orientation. It would be nice for me to do a spread sheet analysis without going into the office. A good Visicalc program is a 200 to 300 dollar buy. I could rent one for five bucks a month and use it as frequently as I wanted throughout the month without spending any more money. That would be a reasonable purchase for me.

But professional software is something that the makers of the hardware seem to think would be valuable. Next to the last is information, simply because as Haines has indicated, I've been associated with the business for awhile. And today, there clearly is not a stand-alone business delivering information to the home electroncially. Maybe tomorrow, and maybe wedded with other kinds of services. But nobody is going to read the Washington Post or the Wall Street Journal off a television screen, when you can fold it up and read it in the car, and then tear it out and give it to your friends, and on Saturday afternoon wrap the fish in it. Nothing replaces that.

The fifth and clearly the most lucrative down the road of the services of the network offices are transaction services. Retailers today claim that they spend somewhere between 25 and 35 percent of their gross sales number in things like distribution, cost of sale overhead. Sears in their last quarterly statement said they weren't going to build any more major storage because it was no longer feasible to follow the segment population shifts. The cost of brick and mortar was just too expensive.

If you could offer transaction services, purchase of goods and services electronically. The retailers are certainly people in your ballpark. We've seen in the last two or three years that the banks and the financial services companies have really pushed that frontier a great deal. There's phone call Compucard, based in Stamford, Connecticut, that has some interesting financial links and investment opportunities. But their whole business is to offer high ticket items, 300 or 400 hundred dollars television sets, from national manufacturers at between 25 and 40 percent of the retail price to subscribers that come either over the telephone or some other electronic means, to their catalog clerks in Stamford.

The normal routine is to buy an 800 number, be identified as a subscriber to Compucard. The operator reads you the kind of televisions that are available today. We have a Quasar and it's 40 percent off. It will be delivered to you through UPS or whatever the normal foot brigade is in your neighborhood. And it will be serviced and guaranteed by the manufacturer as if you'd bought it in a local store.

The down side is, you can't go to Louie's television service who only sells RCA, and expect Louie to service it for you. It's the loyalty issue that always grows up. But in terms of a consumer buy, it seems to be an interesting opportunity for businesses.

Transaction services I put last because there isn't a compelling need now to provide those services. And the other side of the coin, to retailers seeing an opportunity. Every retailer I've ever met grew up watching people walk through the door for a Bandaid and selling them a pair of crutches or some toothpaste while they were in the store. And it's a whole new learned experience to find out how to deal with people electronically if you can't touch them.

I'm suggesting that there is a business selling four kinds of services electronically to the home. And NABU network has found an off the shelf way of simple—without inventing any new technology way to provide those services.

For the cable operator, you've all read in the last year and half about the financial squeeze a lot of the cable operators have been in, as we went to the enormous task of building the infrastructure for cable. Cable operators need ancillary income that has a very low cost threshold. If I can provide an income stream to the cable operator that does not rob him of a video quality channel, he's happy. If I can do it in a way that he doesn't have to spend a lot of money, hire a sales force, service the equipment, he's happier.

For the person who makes the software, the person who somewhere along the line held a copyright to that software, he's excited because there's a larger market now to sell that. But if the hardware manufacturer has not specified a particular kind of personal computer, the more software, the more demand there's going to be for the box—he's a happier person.

And all I want is a piece of the action for putting the translator or the actor in the home. Now, one of the problems we've encountered this morning is the frontiersman issue, having a demonstration unit that we last used about four months ago, to show the British what cable television was alike. And having lost the systemin Alexandria three weeks ago, I discovered this morning at 2:00 in the morning that three wires that routinely sit in the box aren't there. And we spent the last three hours trying to make one. I'm a banker by education, so you can imagine what success we had.

I can promise you two things. One is that after lunch we have a 60-40 probability of having a demonstration of the NABU network in the board room down at the end of the hall.

Failing that, should Professor Murphy still be among us, I would be more than happy to entertain any or all of you in Old Town for breakfast, lunch or dinner or a 30 minute go through the system, whatever you prefer. Frankly at any time that's convenient for you. We've handy to the Hill, and watching a demonstration system is fun, but seeing it live over a real cable system is somebody's home or in an office building is much better.

So I'd welcome you to do that. Thank you very much.

Mr. GAFFNER. The last speaker for this morning is Gene Leonard of VVR Associates. Remember, this was the gentleman on that troublesome term, downloading, who is one of the experts in this field.

Gene.

Mr. LEONARD. The answer is, downloading is upstream. Despite all the confusion, the entrepreneurial—and the desirable confusion that is generated by all of our technology, there are still some technological information science basics that don't change.

And if there's going to be a legislation or any other kind of conclusions of reasonble longevity, they have to be based on what is possible, not only what is present. And they have to be based not on what Haines called the hype, but they have to be based on an understanding of what is behind the hype.

For the past two years, our group has been engaged in investigating the prerequisites—or the requisites, I guess is a better word for electronic telepublishing. And that really means determining the technological capability which can be economically appropriate to obtaining, distributing, monitoring, recording, and using those techniques to reward the creative person or the copyright owner.

I'm going to have to skip through this because we are running way behind.

What we have invoked are some very basic video computing and telecommunication tools in structuring. We've used these tools in structuring our system, and what we plan to distribute is audio materials, video materials, entertainment, merchandising, transactions, education, and general information.

Now, that sounds like just about everything. And in telepublishing we should be capable of distributing everything. And the truth about information technology is that by either analog or digital techniques, we can distribute anything.

There is nothing that is a field of information that cannot be generated, manipulated or in many, many ways handled by our magnificent tools. The only thing our magnificent tools can't do is think of a new idea or have a pun. Although I guess I'm getting into a controversial area with the artificial intelligence blokes. But if they're right, I'm afraid the copyright people are going to have to start writing rules about patent applications by computers.

I think however that's a lower priority problem than the problems you're facing now. Let me try slide one. As we see, the only slide.

What we have here is a condensed version of the various things Haines was talking about. There are a number of sources of all types of information which have commercial use. There are a number of mechanisms for delivering them, which I've chosen to categorize in different forms. Namely, the standard programming techniques which are the free channels, the pay channels, the pay for view channels.

Secondly is a whole wide variety of techniques that have to go through some basic clearinghouse, if they are going to be put in the form which will run over standard gauge technological tracks to get to the ultimate consumer in the home.

And at that clearinghouse there are a number of significant functions which clearly will require legislative impact one way or another in order to regulate them. And they are acquisitions, scheduling, remote control of delivery, auditing of viewing or use, and response.

This slide was prepared for a paper delivered to the Society of Motion Picture Television Engineers, which dealt with the impact that these requirements will have on standard television's technical standards, which have to change if we're to reach the goals that this kind of a system implies.

The methods of delivery have been well covered by Haynes. Those are those boxes down below—broadcast, various MBS, LPTV, et cetera. And of course cable. The one thing I've shown that hasn't been brought up before is the fact that there is not only a downloading, but there is an upstream. And the upstream is a technique which has to be implemented if we use all of the economic and commercial capabilities of our technology. The question is, when it is implemented, you've got some very serious privacy problems which have to be addressed.

But they do provide a way for rewarding the creative person for the use of his creative work. Let me take that off now.

It is not user friendly, talking about buzzwords.

These basic designs have involved a bunch of assumptions that I think are key to the understanding of any system. And I believe they can serve as guidelines in trying to control and understand the technology. We assume that a great deal of bidirectional telecommunication band will be available, combining telephone integrated with video facilities.

The emphasis on upstream in our case is primarily telephone. And that implies another couple of buzzwords. We prefer to operate in a batch mode wherever possible, rather than on line.

It was assumed that this band can carry information representing still pictures, motion pictures, textual information, control information and response information, all with equal facility. And therefore, video display can readily include all of these features, and a single display never has to be degraded in quality.

It was assumed that the two major telecommunications facilities were timesharing and storing forward which is really what we must begin to consider the VCR, not merely a time shifter, but something we like to call storing forward. It's a little more intricate.

These can be invoked to maximize individuality into activity. We assume that a portion of the information processing power must reside appropriately at the user's location, not merely the consumer—well, let's consider him the user, as part of a network with a central transmitter, processor and controller.

What has happened is that electronically mediated information techniques have changed the path of the creative product from the innovator to the consumer. Previously, centralized reproduction was followed by a distribution tree of physical objects. But now, reproduction and distribution can become integral, and more and more so as electronics takes over, do become integral, and instantaneous and universal, and they can occur in the consumer's home. Both distribution and reproduction.

Fortunately, many of society's other transactions are also moving into the home. And thus, the system and equipment course can be conceived as being appropriately distributed. But that in turn requires a series of standards which are initially technical, but which are eventually legislated, that must be constructed if we're going to avoid an electronic tower of Babel.

We assume that the system's distributing, processing and upstream power will allow the establishment of readily modifiable contractual agreements between the provider and the user, all mediated by the distribution system's operator. Knowledge of each use

can be obtained by the system's operator, and given this information, it's up to the entrepreneur, the owner of the copyright material, to decide on what kind of a building scheme he's going to use.

We further assume that if the producers of desirable information are going to be rewarded, then we have to protect their product to whatever extent is economically rational. And that this protection has to be provided as an integral part of the transmission and even the activity at the terminal.

We assume that the quality of presentation in all variations must match the commonly expected quality of the standard medium, and the standard medium is a good commercial underarm deodorant display. And we've got to match that if we're going to reach our market.

We assume that the extreme flexibility in operation and modification of this whole operation would be necessary, and therefore we need appropriate hardware and software design and downloading and upstream capabilities. We created an engineering prototype of the central computer and terminal, but they were too bulky to bring, and so we have a tape representing typical operation that's available for viewing and discussion, thanks to the pause control on the VCR.

Now we're going to move into an experimental operational phase, in which a number of factors will be explored. And these are the human behavioral requirements, the merchandising techniques, the reporting capabilities, the service of community interest, the dialog between representatives and constituents, First Amendment considerations, access roles, privacy concerns, and diversity of access and providers. And if anybody else can add anything more to that, go to it.

But underlying this, there has to be a study of the technical standards used for display, transmission, monitoring and control. And whatever our particular implementation has been, it is very likely that a series of industrywide standards will eventually be adopted. I had that experience in data transmission, 20 years ago, where some of you may remember a data transmission system, a digitronic system which had its own proprietary transmission scheme. And eventually the world caught up and replaced it. But it ran for 10, 15 years.

It is suggested that these standards will have a significant bearing on the eventual ability to meet legislative concerns on a number of levels, and in a number of areas, including those of copyright. Without these standards by the way, and without these basic underlying facts of technological and information life, what Haynes calls convergence could never have occurred.

It is not clear which combination of administrative and legislative entities in the government will be involved in developing those standards, with a view to protecting the very varied public interest. Whether it's a combination of FCC, Bureau of Standards, various professional societies which all work together, is a matter for serious consideration at this point.

But I do want to repeat that despite the profusion of practical implementations we see, there are information and technical basics which can provide longevity for whatever legislation results.

Thank you.

Mr. GAFFNER. So, enough talk, on to the action. We are breaking now, and on the way to board room one, which is down that way, and where all of the meeting rooms and where the demos are set up, it is suggested that you grab a cup of coffee. Several of us are here as instructors or guides to technologies, but especially the students who are here should be in board room one in about five minutes to begin the review with a live presentation, that will be put on.

And then students will break into small groups to kind of go to hands-on use of the various devices. I think it's been a useful morning, I hope it has. From here on, for the rest of this day, the emphasis is going to be on demos. We were hoping to have a four-hour break, but I think that's kind of gone by the board.

So let me say that the demo rooms will be running until at least 2:00, I'm sure, for those of you who want to stay through. We're not going to cut short on your ability to use these on a hands-on basis.

And therefore, we will then come back here at 4:00 p.m. and again have about a half an hour, five minutes each person, of explanation, and then go on into the demo rooms for the afternoon session.

AFTERNOON SESSION

Some people will be joining us as we move along. We have three sessions this afternoon where we will be talking in here. And then we will move into the demonstration room once again, and we hope to have each of the individual presentations run between five and ten minutes in length.

First, this morning we talked a lot about the various delivery systems and terminal devices. And the next session, through, is entitled Educational Technology. I think you'll find that actually, they're using technology that has been created and used in other parts of the new electronic media. But applying it to the great field education. And I think we're fortunate in having one of the biggest and most ambitious projects over the past decade represented here today, and to talk to us about the Plato system and various components of it, we have Jean Harris, vice president of Control Data Corporation.

Jean? Jean will be then announcing her second speaker.

Ms. HARRIS. Thank you, Haines. In one of my former lives, I was appointed Secretary of Human Resources for the Commonwealth of Virginia. In that capacity I received a great deal of media attention, because I was the first of my race and sex to hold such an appointed position.

Three days into office, I received a very beautiful letter from one of the local elementary schools. In childish scrawls was the following message: "Dear Dr. Harris, we are very happy to hear of your appointment to the Governor's cabinet. We would like for you to come and speak to us. Please talk three minutes."

Well, throughout my administration and in subsequent public speaking engagements, I have tried to adhere to that sage wisdom. However I think you're in for six!

Education has entered a new era. Advanced computer technology applied so effectively in other fields is now being brought to bear

upon education and training. The company I represent, Control Data Corporation, was among the first to commit to the concept of computer based education and computer-assisted instruction, as (1) providing a more efficient and economical educational process, and (2) placing the focus of education where it belongs, and that is, on the development of each student's maximum learning potential.

Whereas I will speak specifically of Plato, the Control Data trademark for its educational curricula and course offerings, I offer Plato as the generic example of current state of the art in the field.

In 1962, Control Data and the Unviersity of Illinois began to develop a computer based educational system later to become known as Plato. In succeeding years, Control Data entered into partnership with other universities, software development companies, and more recently, with the advent of "user-friendly" terminals and authoring languages, with classroom teachers in selected elementary and secondary schools.

Plato now features more than 12,000 hours of courseware in math, science, computer literacy, business, foreign languages, the humanities and the arts. The Control Data investment in creating this library was one billion dollars.

Key features of the Plato system are: first, its ability to provide more accessible, cost effective, uniformly high quality education and training; Secondly, individualized self-paced instruction—that is, the student determines the pace of his own learning process.

Thirdly, the ability to update, to review, to explain, to animate and to simulate virtually any activity. Fourthly, the ability to simultaneously address needs of a variety of students studying different subjects at different levels of educational attainment or different levels of eductional competence.

Lastly, expensive recordkeeping capabilities which free teachers from routine administrative tasks, so that they can then concentrate on what they do best, and that is, providing students with personal guidance and support. Plato can pretest, educate, post-test and track educational progress of each student.

Two versions of Plato are now available. The first and oldest system is a network based upon multiple terminals which are connected to a large central computer. This on-line system provides access to the entire Plato library.

The second and more recent system is freestanding and uses a microcomputer plus flexible disk stored instructional programs. With the introduction and use of the microcomputer, Control Data has moved to transfer Plato courseware onto disks which can be used with hardware produced by other manufacturers.

In our hands-on demonstration this afternoon, you will see Control Data Plato on-line, Control Data Plato offered on the Control Data microcomputer, and Plato offered on an Apple, and on an IBM computer.

We all agree that education and training are essential for survival in the intensely competitive environment in which we live today. The flood of recent reports and studies on education in the United States indicate that the quality, equality and productivity of education and training requires improvement. Furthermore, traditional methods are becoming progressively more costly and are deemed by many to be inefficient.

The advent of the microcomputer has placed a new resource in the armamentarium of educational tools. In the classroom setting, the microcomputer and its accompanying educational courseware provide a new oppportunity for equity and parity between institutions and among students.

First, fast and slow learners can be individually accommodated by access to a variety of high quality computer based enrichment, enhancement and remedial activities. Second, schools with insufficient math and science teachers can now provide math and science courses through computer based lessons and courseware. Third, new courses and curricula can be created, and existing ones expanded through utilization of existing or newly developed computer based materials.

Equally as important, adults can be provided with opportunities for continuing education in a variety of topics in non-traditional settings. As example, Control Data operates vocational training and educational institutes. The Control Data Institute provides individuals with technical ability that permits them to enter a variety of computer, electronic and technical occupations.

Similarly, in service training can be conducted in a variety of settings for a number of occupations and professions, e.g., General Motors is using a Control Data course in robotics to upgrade the skills of trained workers.

Lastly, the low skilled or educational disadvantage can be provide with basic skills—job readiness, life management and job seeking skills. Again, illustratively, Control Data for years has been involved in providing training programs for the CETA program eligible individual and now for individuals eligible under the new Job Training Partnership program.

Computer-based instruction is thus being used to address major needs for education and training in schools, business, industry, government, and we are looking at a future in which educational courseware will be used directly in the home.

The explosion in use of computers in such a large number of settings has generated demand for both standardized high quality educational courseware and customized offerings tailored to the unique needs and interests of the customer.

Meeting this growing demand is generating an explosion of software developing companies. Continuous Learning Corporation, a supplier of courseware for Control Data Corporation, is one of those fast-growing companies. I introduce to you Dr. Karen Cohen, president of Continuous Learning Corporation, who will expand on the courseware development process.

Karen?

Dr. COHEN. I didn't think I could be older than Control Data, but in fact my interest and work in applying computers and technology to educational processes predates 1962. For many years I've been doing research, primarily on the faculty of MIT, as Director of Research and Development at the Center for Advanced Engineering Study, trying to come to understand how technology can help learning, can impact on learning, and can provide more effective, more efficient and more appropriate delivery systems.

This work led to a natural involvement with Control Data Corporation and Plato™. Although my company is relatively young,

being four or five years old, my interest in this field and work and trying to understand what makes for good education and the impact of technology on that process has gone on for a long time.

I was asked to talk briefly today about courseware. Courseware is education delivered through software and computers of various sorts. Of interest was the relationship between courseware and intellectual property. In trying to sort out what that really meant, I had to create a little heuristic for myself so that I could understand what coursewares are in terms of levels of complexity, impact of the technology, and intellectual property.

And I'd like to share my own thinking of that with you in terms of some of the products that my company has produced, some of which are being marketed by Control Data Corporation.

The first slide is a picture of a book. That may seem like a very strange way to start out a discussion of technology and intellectual property, but in fact, a book is a technology. A book is a technology that we've been using, in addition to the one that I'm using, namely, talking to you, for many, many years in order to teach, in order to educate.

Computers have become increasingly involved in this educational process. Computer involvement in education is developing and evolving. The first thing that a computer can do is enhance the value of a book. The second slide shows two such disks. We call them "value-added disks.™" The next slide is a sample screen that you might see when you're looking at the appearance of a value-added disk.

Value-added disks™ are attempts to be almost like a workbook on a book. They attempt to help people understand whether or not they've mastered the concepts in a book. There are problems; there are exercises; there's drill and practice; there's feedback. A value-added disk™ adds many of the features to a book that a computer can do for a learner often far better than an individual instructor. A computer, for example, can say, "Sorry, try again." 300 times to a student, although we don't really have that happen often. I think it would be very difficult for a teacher to be that patient.

My reason for showing you some sample screens is that it's my best guess that two thirds of the people in this room have never used a computer for any purpose whatsoever. And when you see some of these screens and then go on to the exhibits in the next room, at least you'll have a first blush familiarity of some of the things that appear on the screens of the assembled computers.

If you were using a value-added disk that accompanies a book, you would get all kinds of interactive things to do, numbers to fill in, equations to make, answers to give, and so forth. You'll have a chance to use these disks in the exhibit room afterwards. What you're really being given a chance to do is apply your understanding and knowledge and test out whether that works.

There's a much more elegant approach to courseware, a much more appropriate approach to adding value to the educational process. That is essentially using the computer as an entire delivery system. We've selected "Computer Concepts" because it is at an adult level, assumes high school reading skills, and it attempts to introduce people in a modular fashion to the understanding and powers of what a computer can do, and it uses a computer to do

that. "Computer Concepts" is Plato™ courseware that is available on multiple micro computers. It's available currently on Apple and IBM, and it will be available shortly on the 110, which is Plato's™ own off line terminal.

If you were to start into this course on one of these computers you might see a screen like the next slide. It is a simulation of the keyboard. What the course does is direct you to certain keys, teach you how to practice with certain keys, and it actually brings you through developing data bases and word processing by the end of the nine hours that it consumes.

One of the concepts, for example, that the course teaches is what a "variable" is. To do that we start with an apartment house, and show people the difference between concepts like location, storage, address. You can put data one place, you can put it another place, you can manipulate the variables.

This is an example of some of the things you might be seeing in the demonstration as you go further in terms of what Plato™ is offering.

This screen represents a much more sophisticated use of the computer. This comes from the robotics curriculum that Jean mentioned. The purpose of this curriculum is to teach people in industry how to work and deal with robots. The simulation that you see here is one in which people actually go through the entire process of programming that robot to remove the god brick and put it in an oven, and record their moves. It's a simulation that people have found quite valuable prior to dealing with programming and working with actual robots.

One of the drawbacks of computer based education is that it often, especially on a micro computer, takes a long time for the system to reconfigure itself around new sets of information and data. And so one of the things we often see is, "One Moment, Please." And I've used such a slide to help us to "break set," in a way, because I'd like to discuss in the second part of my brief presentation, what's really involved in creating these products.

In contrast to writing a book, which generally takes one author—perhaps co-authors—but can be done by one person alone, there are several levels of creativity and intellectual thought that have to be put together to make courseware happen, to make courseware effective.

There are four components, or at least three, that are critical in developing quality computer based educational products. The first component is obviously the subject matter expertise, the author, the person who has the understanding and can convey the understanding that we're trying to teach to other people.

The second component is learning design, a relatively new field. In developing courseware, it's very important not only that we know what we're going to teach, but that it's determined beforehand how we're going to teach it, how we're going to prethink every mistake that a person can make so that the computer can allow for all of the branching, all of the individuality, and all of the special instruction that it has the capability of delivering.

The third component obviously is the programming skills. When one attempts to develop courseware, there are several levels involving output. First, there's what you write down, the intellectual con-

tent. The next thing might be the language that you decide to use, given a micro computer or a configuration. The language may have been created and licensed by somebody, or it may be in the public domain.

The third level is generally some kind of an authoring system, unless you do, as we sometimes do, namely invent everything from scratch, all of the drivers, all of the utilities, all of the components.

The fourth component is quality control. There isn't a piece of Plato™ courseware out on the market that hasn't been through every imaginable attempt to bust it. It's highly unlikely that Plato™ courseware will not function well. I think it's to Control Data's credit for having set standards of quality in this regard. It's one thing to have a good idea and try to program it yourself, it's another thing to try to turn that into an effective courseware curriculum.

That ends my formal presentation about courseware. I know that there are many speakers this afternoon and there may be many questions. The purpose of this talk was to introduce you to courseware and invite you to come and have that hands-on experience with what courseware is following this session.

Thank you.

Mr. GAFFNER. We will now shift into about ten minutes, 15 minutes on electronic publishing. This incorporates primarily the worlds of online data bases, videotext and teletext.

First, Myer Kutz from John Wiley Corporation will tell us something about the world of online databases which today primarily are being used in the business information field, some in the home, where the others are more mass market technology.

Mr. KUTZ. Thank you, Haines. In defense of those of us who have written books, and not to take issue with our last speaker, it sometimes seems to me it would take this long to write a book [hands spread wide apart], and this long to get an abstract painting out of the door [hands very close together]. It takes about this long to write a software program [hands six inches apart]. But that's only a bias.

Actually, I brought the simplest piece of equipment here, a dumb terminal that looks like a typewriter. You will see it in the atrium area outside the boardroom. It's connected to an acoustic coupler and to an ordinary telephone, and then connected online to a computer in Latham, New York, into which have been loaded a number of data bases.

Although I brought the simplest piece of equipment, it took me four hours to get it working this morning. Luckily, this hotel is well supplied with a publisher's favorite food, alcohol, which in this case I used to clean one of the keys of the terminal.

Actually, the last time I met with so many politicians in one place was back in the 60s when I ran a campaign—a successful campaign—for a seat on the Cambridge city council. Cambridge, MA, not Cambridge, Maryland. That's an office of such high eminence that the reward for a campaign manager is that you don't have to do it a second time.

Well, let me talk to you a little bit about electronic publishing. First of all, let's say quickly what the markets for this information are, and as Haines implied, they are professional markets. They in-

clude not only business people, but also, particularly, lawyers, chemists, and people who do medical research.

The data bases that are available online contain essentially three kinds of information. The business started with data bases that are essentially lists of bibliographic references. For example, Chemical Abstract, which is a branch of the American Chemical Society, compiles bibliographies of the world's chemical literature. You can search through these bibliographies to find out, for exmaple, what a particular chemist has written about phosphorus chemistry in the last ten years. Or what anybody has written about phosphorus chemistry.

The second kind of data base that you can find online include those that contain data, mostly the kind of data of interest to people in business, mostly economic data.

I think there is a display of software from Visicorp that you'll see.

Well, you can use data from data bases and plug that data into that kind of software in order to decide, for example, what our costs as a hospital administrator might be in three or four years.

The third kind and the newest kind of data base is the full text data base, that is to say, electronic editions of materials that have been published in print before. For example, one of the ones I'm involved with is the Harvard Business Review. Also the McGraw Hill professional magazines are all available online, full text.

And there are other publications from Elsevier, for example, another publisher who is here. The American Chemical Society has put its scientific journals online full text.

An important point about all of these data bases is that in most cases there was a prior print counterpart and that print counterpart was copyrighted. Often, you will see a copyright message on the screen, or in the case of what I can show you, on a printout of a data base, prior to actually getting into the data base.

As I asked before, basically in this industry at the moment, information is stored on central computers. There are many so-called hosts who operate computers with so-called search software with which you can search through the data bases. And basically the access is by telephone.

The real power of these system is that you can sort very fast through a tremendous amount of material. That's the whole point. Even with the full text, the point is not to read publications on screens. (People have been defending print, worried that electronic publication was going to take over from print and have always said, well, you can't take these terminals to the bathroom. Well, of course you can.)

But I think the point here is that it's not the notion of being able to read things on a screen, it's being able to search through large volumes of information to find out where pieces of information are. Then possibly you can print out an article at your convenience, or you can go get the original hard copy of the article.

The way customers are charged in this business is by time of access. This business really is—has traditionally been—run by computer people. Now that more and more publishers are getting involved in it, there may be—there is—pressure—I know I exert it—

to begin to charge customers by subscription, the same way you charge for magazine subscription.

This is important, because one of the concerns, and I know you heard a comment about upstream downloading or downloading upstream or something this morning, is that if you basically charge by time of access and the information in the data base is captured by the customer on his own terminal, that means the customer can then search through that information with the proper software, without accessing your data base.

He cuts himself off from your data base, searches locally, doesn't pay you anymore. That is possibly copyright infringement. Of course, the discussion revolves around that word downloading because it's an extremely important word, as you heard this morning.

In the future, one of the ways to get around that may be the pricing mechanism, which as I said would be subscription pricing, rather than charging by time of access. Or by changing the nature of the business. Rather than having a business where users have only one means of accessing the information, which is dialing up from remote terminals to central computers, with the proliferation of more and more powerful computing equipment locally, you'll be able to sell people tapes of data base, which they can search through themselves, and you sell them the tapes on a subscription basis. Those would be for main frames. You may even be able to sell information on disks for micro computers, when there's enough storage capacity, or there will be use of an even newer technology, which is video disks or even laser disks.

These disks allow for a tremendous amount of material to be stored on them, and they have been developed now to the point where you can search them with the same facility and speed that you can search regular online data bases.

So basically that's the shape of this industry. Those are some of the questions that the people in it are grappling with. And if you stop by the terminal, which having been fed enough alcohol and I think is working, I'll show you some data bases in action.

Thank you.

Mr. GAFFNER. Two of the technologies in the electronic publishing arena that get most confused are videotext and teletext, that we'll now be hearing about.

We must remember, as we look at these, that as they have become a reality in the marketplace, though they are still experimental, that in actuality most commercial individuals and companies now see them more as being viable in transactional services than a variety of different applications in addition to the delivery of information.

After the UK spent $80 million trying to launch Prestell as a home information delivery system, all of it wasted and now disbanded, there has been a lot of disillusion about when the market will actually be ready for delivery of information to the home.

Therefore, these systems are being implemented with heavy emphasis on advertising transactions and a varity of other applications. But when they do prove themselves, they will then become massive ways to deliver all types of textual information.

Albert Crane from CBS will start first, and all of these are going to be demonstrated live in the other rooms after these talks. I do

want to say as Albert is coming up here from CBS, which is going to show us teletext, that we are in the vicinity of the world's greatest experiment now in this arena, Viewtron, which John Wooley will be talking about. Viewtron is now rolling out in South Florida. How many subscribers do you have now, John?

He's very secretive about that; they'll never answer that. I thought I'd get him in a forum like this. But at any rate, that experiment which will be piped in live, I want to say, I've seen John's slides around the world. They're very beautiful, and he will not be showing us slides because he'll be showing us live. So I encourage you to make sure you go by and see those. However, he said the slides from teletext are similar to video disks.

So we'll turn it over now to Albert Crane.

Mr. CRANE. First, I'd like to thank Stan Gerendasy, Director, Engineering & Operations, EXTRAVISION who is director of operations, for making this all possible. We will be lodged in the other room. I'll also mention that NBC is on the air in this market during their network time. We hopefully will be on the air during all time.

I don't know whether I'm going in the right direction, I guess I'm not. All right, thank you.

Secondly, I'd like to mention that the pages that you're looking at are all done in the new technologies; these are all computer-driven graphics. While Haines is correct that we were in the experimental stage back on April 3, 1983, we premiered with a nationwide service called Teletext, three days after the FCC approved us. As you know, there are 83 million television homes. We're currently in 71 million television homes with this product that I'm showing you.

But before I take you through that I'd like to tell you what we're not. Firstly, we are not videotext. Videotext is two-way transmission of data, which John will be showing you at great length and has available to see, as we do.

We are the one-way transmission of data. Now, you can say one-way transmission of data; how do you get there? You've all seen the black bar on your television set. The black bar is called the vertical blanking interval. We call it VBI teletext, vertical blanking interval teletext.

That consists of 21 lines. In those 21 lines, we've been authorized to use six of them, of which we've now selected four, lines 15, 16, 17, 18 through which we will transmit data. If you look on Channel—is it 9 here? Our CBS affiliate? Four, thank you. I'm a New Yorker, what can I tell you? California, you flip the vertical line and you will see a little stream of white data. That's the CBS teletext service, known as extravision.

So here, we're on the vertical blanking interval, as is NBC during network time. Think of it as an electronic carousel spinning very very quickly. But once you press a button, the slide drops down onto the full screen. So we're not talking about a transmission of data that just uses up portions of the screen; we're talking about transmission of data that drops down into the entire screen.

And as I just demonstrated, here are some of the things that we can do. This was a benchmark day, as a matter of fact, it was May 23 that's the day the Dow just got to 1200. Apparently last Friday

it just dropped down to 1200. So it gives you the perspective as to where things are.

This is the kind of pages that we do. We'll be demonstrating these to you live in one of the demonstration rooms later. I call our service a color newspaper that updates itself every 15 minutes. That's in essence what we're able to provide.

Here's some other examples of the kinds of pages. Here's a weather map. The weather doesn't change every 15 minutes; you can probably get away with changing the weather three or four times a day, and accurately represent what's going on.

Here's another use of our service, the airlines. In this case, I believe all happen to be late. Well, yeah, I guess they are. That would never happen, of course. But that's an online service that we can provide to viewers. Here's an example of a crossword puzzle, electronic crossword puzzle, where you have a degree of interaction that can be done. But not the kind of interaction—don't let me mislead you—that can be done with Viewtron service or banking at home (or Pronto's Chemical Banking System), or any of that kind of thing. We're not two-way, but a one-way service.

One of the most important features of our service is that we are "on demand." And by that, I mean you simply press a button with a hand held device, similar to a remote control. This is the remote control device that I hope you'll all have a chance to work with it later.

What you do is, you press two buttons. We have a 100-page magazine that's spinning very quickly in the air. You press two buttons, ask for page 05 or 87 in this case. And you press the entry button, and within ten seconds the slide drops down into full screen. The carousel has to go the complete rotation sometimes, and it can take up to 20 seconds. If you happen to be on page 86 and you ask for page 87, you'll get it almost instantaneously. But if you ask for 85 it will have to go the full rotation, taking 20 seconds.

So it's approximately ten seconds away for an "on-demand" service. Secondly, it's very user friendly. You only need to be able to press two buttons. You have to be able to press the correct two buttons if you want page 21 or page 87. But you can get the service very quickly, and you don't have to be a computer whiz to figure out how to use our service.

Thirdly, and probably, most importantly, our service is free to the American public. Like television and radio, we expect to be advertiser supported.

Now, that's all well and good. You can say, you're in 71 million homes, Albert, but how do you get it? How do I see it? Well, that's the obvious question. I've been in this job 14 months, and we think we're on the verge of solving that problem.

The problem comes to—teletext technology has been in the process for—we started in the spring of '79. The British as you know with their Oracle have been on the air apparently in a million, five households——

CBS started a long time ago with trying to improve the technology. We finally have gotten the product now available, and what we need of course are the decoders because if you can't see the product, well, you don't have a business.

So for the next couple of seconds I'm going to give you a little progress report on what's going on in the decoder field. Firstly, there are professional decoders. These cost thousands of dollars and are available from two major vendors. One is a Videographic Systems of America. That's the French government. What was called the Antiope system has now been brought up to our system, called North American Teletext Broadcast Standards, NATBS. And we are available, and you can purchase the decoders from Videographic Systems of America.

You can also purchase the decoders from Norpak, a Canadian firm, which is the teledon technology. Again, it is compatible with NATBS.

The Norpak people have decoders available, and can be purchased. Right now, they're basically being purchased by television networks and by affiliate stations, not by the public. So then you ask, when is the consumer going to be able to get in the game?

Well, the good news is that at the recent CES consumer electronics show in Las Vegas, both Sony and Panasonic made announcements. They announced that in mid-1984, Sony would be in the game. We just happen to have done a teletext page announcing that feature; probably there are only 50 or 60 people in America who could see it, but we thought those people might be interested.

And Neil Van derDusen who's the president of Sony consumer products, said, Sony recognizes the significance of new information delivery systems in society and the future growth potentials of the teletext interest in the United States.

So we've got the Sony people involved, and they expect to have their product out in mid-1984. The next major vendor to sign on is Panasonic. And I have some of the brochures here which are very generic in their pitch. They do not attempt to sell their product, but I do have a couple of these available. It discusses the kind of product that we're about to offer. It's kind of a little leave-behind; it's not something that CBS has anything to do with.

But Panasonic has announced delivery, and does have three or four thousand decoders available for a list price of approximately $900. You have to purchase top of the line TV called the Omni, which is their version of the Profeel. The product, that we have here to show to you today, is a 25 inch Omni, plus the decoder which sits on top. The decoder lists for about $900, they expect to be selling it in the open market for $700. However, I want to comment in a few minutes about where we think the prices are going, the decoders, because there is no marketplace, in my view, at $700.

Okay. Quasar is also in the game. They're a division of Matsushita and they also announced in our standard. Beyond that, what about some of the American manufacturers? We know that's coming soon, RCA will be in the game. RCA will be coming out with a product that's built in. By that, I mean it's not a stand-alone unit.

In mid-1985, we expect RCA will have made some announcements, but we're not in their business. And of course, RCA owns NBC and that would make some sense, for them to be in this particular game.

Zenith has made some announcements in another standard. We expect they will come along in our standard as well. In addition,

Hitachi is about to get going in the teletext business. So we've got five or six major vendors about to produce consumer decoders. Our product, whether it's NBC teletext or CBS's Extravision, you will begin to hear about and see more about in the trade press. Because the consumer will begin to be able to see it.

Now, there are a couple of issues that I'd like to just quickly touch on. Gladly continue in private, or perhaps even better, Bill Lilly will be here tomorrow representing CBS on the policy issues. You can discuss some of these with him.

I'd like to just briefly tell you what these issues are. Firstly, the FCC did not give us a standard. As in many cases, the FCC today has a laissez-faire approach, and is suggesting to let the marketplace decide. The two standards are the North American Broadcast Teletext standard, which is the one we've endorsed, which NBC's endorsed, AT&T and many others have endorsed this, along with the Canadian government and the French government.

But there is another standard, and the other standard is called World System Teletext, and it's featured basically by the British. And this is what the Oracle service would look like, if you happen to have an Oracle opportunity.

We didn't bring it in, but this is what I call the "Lego look", which we have walked away from. It's suggested that this kind of technology is not good enough for the American public.

Now, the reason I say that is because of advertising it over the air. We do not think—and we'll go backwards for a second—that color separation as it occurs on that map is possible for the American advertising family. We think that the "Lego look" is very difficult to sell to the advertising community.

So as I said, I'm going forward again. We've come with a product that looks more like this. You can see 50,076 dots on that screen, as opposed to 4,800 squares. You see colors laying on top of each other. We see a product here we think we can sell to the advertising community. Primarily because we can make logos very small. The smaller we can make the logos means the more information we can put on the page.

So that's the service that we're attempting to sell. That's why it's going to be free to the American public, because we expect the business to be determined by the revenue that we can get from advertising on the air.

Let's quickly talk about localism. One of the more important aspects of television, as you know, is not just the networks providing "M*A*S*H" and "After M*A*S*H," et cetera, but the local station providing an individual marketplace product. What we have in this country, as I said, is 85 percent are passing our current product. Eighty-five percent of the United States has the product on the air. More specifically, we have one market, Charlotte, North Carolina, which is about two weeks away from what I call local origination.

We're preparing a 100-page magazine which we're asking our affiliates to take 50 pages away from us. So it will be a combination of a local magazine and a network magazine that's going to make the most sense. Also, in Buffalo, New York, we have an affiliate there that's about to get into the local origination business.

To answer a question I know you might have, what is it going to cost the station to get involved. About $150,000 to purchase the

hardware. Probably a staff of about four people, incrementally, about a $300,000 investment for a station to get involved, to bring it up.

We think that just the network service is not sufficient, because we see this as very much a local business. Just a couple more comments. Another issue that's very important to the television business, of course, is "must carry". The FCC did not give the teletext business a "must carry" mandate. A cable operator has the right to strip teletext. Because CBS did not feel that that was in our best interests, or in the industry's best interests, we have asked for a reconsideration petition at the FCC.

And if you have questions to that end, I'll let Bill Lilly speak to them tomorrow.

Probably the most important aspect of what I call program related is how we relate to the television screen. We have a feature called the burst through feature. So while someone who has one of these decoders and has the remote control device as I'm holding up here, with a decoder on top of his television, has an opportuntiy for a feature to burst through the screen. This will only happen in homes that have decoders; it will not happen across the country. We can burst through information that relates to what's going on the television.

The best example of which, of course, is captions for the hearing-impaired. CBS has been strongly committed to captions for the hearing-impaired. Again, a very sensitive issue, one that we can deal with over cocktails or perhaps at dinner. But we strongly believe that the NATBS captioning that we're providing for the American public is the right way to go.

The reason that we feel so strongly is that we're not just talking about a $700 or a $900 decoder. What we're talking about is a VSLI chip built into television sets in mid-1985, bringing the cost down to $150 to $200. That's why we believe so strongly that ours is the right technology. We're not talking about a service for the hearing-impaired that's going to cost $300 or $400 or $500 or, much worse, $700 or $800. If that's the product that we have to offer, then we don't think there's a marketplace. Until this gets built in as UHF, is built into televisions today, we do not see it as a viable marketplace product.

So we're looking for the day when the chips will cost $25 or $30 with an add-on feature, perhaps $50 or $100 for the consumer. And that's the day that we feel we'll be able to provide a service, not just for the hearing impaired, but for the sight impaired.

Everybody in this room has an opportunity to learn and get more information that you might want to know. An example might be the airlines leaving here, when do they leave. Bridge closing, school closing. We can provide all kinds of community service that the regular television and radio stations cannot easily provide.

So we have this opportunity. I'd just like to close with a couple of slides. The product, as you'll see it in the other room, builds on the air. So what comes on the air, bang, doesn't come on this way. So there could be a certain amount of doubt when the picture starts to form as to who this might be, but I can't demonstrate this here. I think everybody figures it out fairly quickly, that's exactly who that is.

Now, the other feature I wanted to show you, because of the graphics we can do, that's obviously a candidate for the presidency. We have another candidate for the presidency that I understand is going to re-run after—you may or may not be aware of this—sometime in mid-April, CBS is doing a mini-series on another president. And word has been around that he's going to run again. And of course, Uncle George may or may not make it as the Democratic candidate.

I thank you all very much.

Mr. GAFFNER. Albert, I thank you. Just one comment on the teletext. In Europe, it's one of the problems you also face, though, the British standard might not appear as well. They have over a million users of teletext in homes. It also is free in Europe, but there it's subsidized by the government as a news media to the citizens, where here in the U.S. it will take an entirely different course being an advertising supported medium by the network primarily.

Now, for hearing about the largest world's experiment today going on roll-out, commercial roll-out, I apologize, John. It's definitely commercial. John Woolley from Miami, the Knight-Ridder Group is building this very fine system called Viewtron.

Mr. WOOLLEY. Thank you, Haines, especially for emphasizing that it isn't an experiment.

I brought my keypad, too, and if you're wondering why Albert and I are carrying them around, it's because the—some refugees from Mark's bar mitzvah have turned out to be high techies and chipheads. [Laughter.]

And it's the only way that we can keep our machinery from being selectively destroyed, I think, each time we leave the room. If you don't believe that there's a market for this kind of stuff, I suggest you go to Mark's bar mitzvah. [Laughter.]

Somebody a little earlier said that maybe two thirds of the people in here have never used a computer. Could I see a show of hands of people who have never used a computer?

There may be a market, okay. I'm the editor of Viewtron, as Haines told you, and Viewtron is in fact a commercial venture down here in South Florida. Let me tell you a few things about it. I'll be brief, and I'll get out of your way so you can punch the buttons, because that's what important.

Viewtron is an electronic home information service. The information is stored in the central computer. It is transmitted into the home over regular telephone lines. There's a decoder that you have to buy, but then it's displayed on a regular TV set.

If you have it, you can shop with it, you can bank with it, you can help your kids get educated, maybe. You can read the latest news, you can read weather, you can read sports, you can send messages, you can play some games, although they are not games that really look like videogames. In some ways, they're a little more challenging. In some ways they aren't as good.

And it does all of this because, unlike Albert's system, it is two-way. And that means that messages are sent from the home back to the computer as well as being sent from the computer to the home. And I won't go into that much at all. It will be obvious to you when you see it.

The displays in general look very much like what Albert just showed. And you'll see those as well. But as I said, the delivery is different. It comes across telephone lines. It has nothing to do with commercial TV. It has nothing to do with cable. It is straight phone lines. It is much more like a computer talking through a modem to another computer somewhere else.

Viewtron has been developed by two—or actually, three corporations. As the editor, I work for Knight-Ridder Newspapers, which is a billion-dollar newspaper company headquartered here in Miami. We own the Miami Herald, we own the Philadelphia Inquirer, we own papers in Detroit, San Jose, St. Paul and a number of other cities around the country.

RESPONSE FROM AUDIENCE. [And Long Beach.]

Mr. WOOLLEY. Absolutely. And Little Long Beach, too.

We program and run the central computer, but we developed the service itself. We've been at it for about five years, and we have spent about $30 million at it so far, or will have, by the end of this year. The second and third companies are AT&T and Southern Bell. And they developed—AT&T developed a thing called the Sceptre terminal, which they now sell, which is the decoder that we use. And Southern Bell provides a special local area data phone network which as far as the phone customer is concerned, he never knows he's on it. It just seems like any other phone network.

And some of you will certainly recognize now, with Viewtron and the Sceptre terminal, at least one of the reasons why AT&T showed some grudging willingness to break itself up. Obviously, that's all significant.

If you like what you see today, and I'm going to make a pitch, you can go buy a Viewtron. You can go about four miles up the road to the Burdines store at Broward Mall and you can purchase the Sceptre terminal for a special introductory price of $600, even less than a teletext decoder, for that money.

You take it home and the Viewtron subscription price is $12 a month, flat fee.

Well, but in addition to them there are also the—there are computer companies who will likely be making equipment compatible with the kinds of services that Viewtron is—at the point that they're satisfied that there's a market for it.

In addition to being an editor, I'm also a lawyer, and so I just love to talk about the impact of all of this on things like freedom of the press and privacy and copyright law and all of that. I won't do that now; I'll do that later if anybody actually asks me.

Thank you.

Mr. GAFFNER. We've now covered one major part of electronic publishing. We now move on to the optical video disk, which is also related directly to the field of electronic publishing, yet with virtually a much broader scope.

And there, confusion exists, of course, because we've all been blitzed with the video disk campaigns of RCA and others, and we're talking now about a different use of the technology. We're not talking now about the entertainment use of the video disk technology.

To tell us about the new directions that are unfolding—also, is Sony getting into the entertainment in their display?

Mr. GAFFNER. Okay. So the afternoon and the demonstrations are not as—North America-Phillips does show their video disk used as an entertainment device. This is more of a storage device. And to tell us about it and introduce the others on his panel we have Joseph Price, who is the chief of the science and technology division of the Library of Congress, and also director of the Library's optical disk pilot program.

Mr. PRICE. Thank you very much. It's a pleasure to be here. I see that we've accumulated all of the spare time at the end of the program. However, we won't use it, we'll try to go quickly, because we know that you're all eager to go see some of this very good equipment that's been assembled here.

I would like to take just a few minutes to talk about the application of the Library of Congress' optical disk program. The topic is relevant to this seminar, because of the many copyright issues it raises. I've tried to reduce a large amount of information down to just a few slides, which I will have to quickly flip through, unfortunately. If I cover something too quickly, please by all means stop and ask me during the demonstration period for an explanation. I should also like to point out that in your notebook, I believe, you've been provided with a brochure about the Library of Congress' program, and that should provide you some additional information which I will have to go over very hurriedly.

After I speak for a few minutes, I will introduce Mr. Steven Gregory from New England Technology Group, and John Hartigan from the Sony Corporation. These two gentlemen have kindly agreed to come and bring their very advanced state of the art equipment and approaches to this important topic of using high technology as a means of preserving and storing knowledge, and also as a means of creative access to that knowledge. And that, in effect, really are the two core themes of my talk, that is, preservation of man's cultural knowledge, and more creative approaches to the use of this information.

You've seen and heard an abundance of acronyms today. I'll try not to throw anymore at you, except one very relevant acronym, which is the one which I will try to use as the guiding principle in my talk. This acronym is known as MASE. And that means, the "mind absorbs what the seat endures." So I'll try not to have you sitting too long.

You will hear me during this presentation occasionally making reference to analog and digital types of disks, that is to say, video disks and optical digital disks. We're using both of these kinds of technology in this program. I won't try to make the distinction now, but there are some technical distinctions. Again, I invite you to catch up with me or any of the other two speakers for an explanation of these technical distinctions.

Suffice it to say for now that the analog disks are better suited for color motion sequences, which is an important part of our pilot program, and digital is better suited for pictures or digitized snapshots of printed pages. So that's as much as I will say about that distinction.

Now, this talk features a number of opportunities provided by optical disk technology which we hope to exploit. And I'll go through these on the slides now. This is a three-year pilot program,

and I put a great emphasis on pilot, because we're in pursuit of a lot of answers which we hope will be of benefit to the Library in the future.

The objective of this program, as you can see, and I won't read it for you, is to exploit the use of this technology for the opportunities it presents in information management and preservation. Optical disk as you've come to know is the recording of information at the wavelength of light, and this recording and reading back is accomplished by lasers.

Why optical storage? Because of their high density and resulting high storage capacity, optical disks permit the efficient storage and retrieval of digitized images, and because they are read by reflected light, no wear or image degradation results from playing the disks.

This is very very important when you are considering the preservation. Because unfortunately, as much as we would like it to be true, the statement on this slide ("Man builds no structure that outlives a book," Eugene Ware, circa 1898) is not true. Changes in the paper making technology over the last century have resulted in the use of acid-based paper, a cheaper form of paper, easier to manufacture. But unfortunately it has the negative consequence of books literally deteriorating on our shelves.

This slide of a crumbling book being blown away by a staffer as if it were a dandelion is not an exaggeration. We have books that are highly embrittled and are coming apart, like this. And of course, since we get materials from all over the world, many of them arrive at our doors already in an advanced state of deterioration.

We are also seeking better means of service in this project. We would like to be able to provide more than one user the same sort of information at the same time if necessary. And when you have custody over about 80 million items, inevitably some of them are not going to be on the shelf. We would like to reduce the incidence of that sort of problem as well.

So we seek to exploit several opportunities here in the preservation area. We seek a stable storage medium, one that will last not in terms of tens of years, but in hundreds of years; to electronically monitor any possible loss of this information that we've so stored; to transfer it without a loss in quality; and again, I repeat, the important point of no physical contact with the media itself.

To balance the preservation concerns, we are also interested in exploiting these retrieval and storage opportunities, these service opportunities. I won't go through the list, many of them are apparent to you, especially from what you've been hearing today.

This project, as I said, is one of three years duration. We divided it broadly into two categories, print material, where we're using the digital technology primarily for text material, and the nonprint side of the project, where color and motion sequences are very important.

This slide, of course, is representative of print materials, which we hope to put on the disk, including, I should mention maps and manuscript and printed sheet music. And this information is scanned by the scanner that you see on the right, and displayed on the very high quality, high-resolution screen. This slide is broadly representative of the kind of quality. And, of course, these images

are capable of being printed out by the laser printers shown in this slide.

The images are stored on an optical digital laser disk as depicted in this slide.

Now, the non-print side, where we are using analog technology, which is primarily a television technology in this context, we had high-quality photography made of a number of our special collections in the Library of Congress. This photography was subsequently mastered onto video disk by our contractor, the Sony Corporation of America. It will be then presented on television screens with caption information overlaid on top of it when desired by the user, and sometimes we will also, just for experimental purposes, use a separate television screen which contains the captions, so that the picture is not encumbered by them.

In the analog portion, we are making several video disks, and we are also, I should say, making two compact audio disks. You saw those and heard those this morning.

With regard to the laser video disk, I won't go into a great deal of technical detail, but basically there are two kinds, which permit stopping at pictures (continuous linear velocity), I should probably explain to you that there are 54,000 frames possible on the first type of disk. You can use that for storing and displaying still pictures. In other cases, if you want to have long sequences of motion pictures, you can use the continuous linear velocity, the second type of disk.

Still image disks are where we're using the 54,000 frames as separate frames of information. There we will store a number of photographs and other images, for example, these Depression era color photographs from the Farm Security Administration and the Office of War Information collections.

We are storing some architectual drawings. For example, you might be interested to know that this was a rejected design for the first Library of Congress building. We are also storing examples from the American Cartoon Drawing collection and a number of other motion picture and drawings.

A very important disk will be the disk containing motion picture publicity stills. We have unique collections of these in the Library of Congress. We're placing 90,000 on one two-sided disk, and will manage their retrieval according to various means.

I mentioned motion images disk. We're putting portions of seven color motion picture films, each filmed with a different color process on one disk. We're interested in using this as a means of testing the color image—quality of color images over time, and also in establishing a baseline from which we can compare the degradation of color in motion picture films, which is a very serious problem. The particular film, shown in the slide, "With the Marines at Tarawa," contains some very unique color combat footage, I believe the first ever produced.

We also will be creating a disk that contains teleproductions, that is, television productions, CBS news in this particular case. And I did mention to you that we will be creating a couple of compact audio disks from the very good programs that we regularly have in the Library's Coolidge Auditorium.

This is not the Library of Congress' first effort in using optical digital technology. We have had a responsibility over many, many years to provide cataloging card information to libraries around the world. This inventory has now accumulated into millions of millions of cards. So we seek to scan these cards and store them more densely onto optical digital disks, and be able to pull them back up and print them out on demand when libraries need them.

Well, this gives me an excellent opportunity to point out one other feature of this technology which we hope to exploit. And that is one of image enhancement. On your left of this slide you see one of the cards that had been soiled and abused over many years. It can be scanned and all of that dirt and grime effect wiped out and a new version printed on laser printers, that's what you see on the right of the slide.

Density is the name of the game, with the technology. This is one of my favorite slides. It illustrates the very large numbers that we refer to when we talk about storage density. We won't try to go through all of the numbers. Suffice to say that you can store a billion bytes of information on a disk, one side of a disk.

This slide is roughly illustrative of the storage area that is accommodated by different technologies. A printed page—I won't go through the numbers, but a page in effect as it is reduced to microfilm, as it is reduced to 98-frame microfiche and finally, as the same page can be stored on a digital optical disk. The slide implies that the storage on the disk would all be sort of clumped together. Let me quickly say that the bit stream associated with the digital image of the page would actually be stretched out on tracks among the disk.

So in summary, this slide repeats these various facets of this technology which we hope to exploit in this three-year pilot program: preservation of materials, service, random access, space, compaction and image enhancement.

This next slide reminds us that this project is designed to help us answer these two questions: how can disk help preserve Library materials, and how can disk help improve Library research.

Thank you very much.

I would like to now introduce Steven Gregory, and he will tell you a little bit about what he will show you in the demonstration room.

Mr. GREGORY. We've seen how the optical disk is a very high density storage device. There's a few things that need to be added to that, however, to use it as a very effective information access device. And my company is involved in developing computer software and computer hardware to go along with such technologies as the optical disk, to help our clients get much better access to some of their information bases.

First thing we add to it is a computer, an external computer, which is usually a small micro computer, which can control the optical disk, which allows traditional information processing and recordkeeping technology to be added, so that—as well as the same kind of information technology that's used in text information.

This gives you the ability to access immediately huge amounts of this visual material in the case of a video disk, as well as text in-

formation. This means you can treat a photograph or a movie as a piece of information in your data base.

The other thing that you can add is some intellectual creativity as to the format, and develop new structures of information using this medium. So instead of—one of the things you can think about is the idea of something that's sort of like a book, except as you flip the pages, the pictures are movies instead of still pictures. Just one of the simplest ideas.

Some of the other ideas for the formats that this can take are simulation of very expensive or new pieces of equipment. You can actually use a video disk system to simulate a complex, high-technology piece of equipment, something that's much too expensive to have a lot of copies of, to use for training, for example.

The other thing that our company is very interested in is adding simple mechanisms which allow people to communicate with the technology in very simple ways. And as you'll see in our demonstration, one of the things we use a lot is a touch-sensitive display. That is, it's a television screen which allows you to just punch the screen and point to various objects on the screen, thus eliminating some of the anxieties that people have about using computers or computer keyboards.

There are other devices as well. Someday, for example, speech input will be very prominent as ways of communicating with these machines to describe what it is you want to access from that system.

As the example that I'll be showing in the other room, we'll have a system which was developed with a large pharmaceutical company for training physicians on some new procedures in cardiology. Basically, it has several different modes of operation, and one of the most interesting, perhaps, is where the physician is given a patient history, you actually see the patient—you see cardiograms on the screen and so forth. The physician then gets to choose from several different diagnoses that they can make, and then follow up and suggest various treatment. And they can branch through all the possibilities, seeing the results each step along the way.

So we're looking at the video disk as the basis with which the micro computer is a very powerful personal medium, what we call a stand-alone system. It's very much a portable, personal kind of system which some day may evolve into the size of a book, with the same kind of features, which is a very flexible medium for accessing complicated kinds of information for presentation.

Thank you.

RESPONSE FROM AUDIENCE. Can I ask a question? You said something about simulating the way a particular piece of machinery might operate, without having to have those same pieces of machinery available. Assume you were instructing a class this size, and you didn't want to have just fifty machines for fifty people, but you needed hands-on individually at all stages. Do you tell me that you could have a machine with software that would literally stimulate the operation of a non-existent machine, non-present machine, and you could train people through a computer device to run that non-present machine?

Mr. GREGORY. Yes.

AUDIENCE. By simulating what the machine would do at every step?

Mr. GREGORY. Right. This has been done, for example, for a tank, to simulate the gunnery procedures involved in a tank. It cost a hundred bucks to fire a round. So there are simulators, based on video disks, that provide an extremely realistic kind of image for the sighting, and actually allow the operators to simulate what they have to go through in a battle sequence, using that.

Other kinds of simulators are for driving around, to allow you to literally choose the directions here, and you see a continuous stream of visual information which you can speed up or slow down, make turns. And by simply having the computer access the proper visual sequences which were filmed by traveling down the street, it's a simulation and you're actually in control of where you go.

AUDIENCE. Of course, they've been doing that for years. Even when I was in driving school, I remember seeing simulations. So what is so new about that particular kind of simulation?

Mr. GREGORY. Well, as far as I know, without spending a lot more money, it's really the only way to—you can literally drive anywhere you wanted to in New York City, for example. You can choose if you want to turn a left on Fifth Avenue, if you want to speed up to 60 miles an hour and then stop. You can actually turn a button and change the seasons, watch it snow, if you like, as you're moving along.

AUDIENCE. I see.

Mr. GREGORY. It's just a little different than—they had some mechanical versions of that. We had a little camera in a car and you were steering that. But this is all done in very inexpensive—let's say, $5,000 range type of a station. For example, a very good kind of system in any kind of high technology type equipment, for example, repair of an aircraft or repair of electronic devices. These are some of the areas that it's now getting a wide range of acceptance.

My basic point, I guess, is that where video disks might seem to have flopped as movie machines, which was simply one marketing choice for their first commercial feasibility, what we're seeing now is, when they're hooked in with computers, it becomes a much different story. It's a very interactive media. It's a medium for storing visual information and accessing it very rapidly. And this opens up just whole new situations for many different kinds of applications.

AUDIENCE. Thank you.

Mr. TAUSKEY. Thank you. I think just in reference to that last question, I might add that what we are seeing with interactive video disks is actually a new form of publication. And that should hold some meaning as you consider the copyright issues.

For example, I invited the Massachusetts Institute of Technology folks to come down and show us some of their very good work in their area over the last few years. Unfortunately, theirs is not very portable. They've got some very interesting experiments going on in, strangely enough, the school of architecture.

I have a video disk that illustrates a lot of the things that they're doing, which if there is an interest at some point during this seminar, if I can kindly beg the use of a video disk player from some of our demonstrators, I'll be happy to show you little portions of that. So just catch me if you're interested.

I'd like to now introduce John Harrigan of the Sony Corporation. I should say that John works with us on our Library of Congress optical disk pilot program. One of the contractors in that effort is Sony Corporation.

John?

Mr. HARTIGAN. Thank you, Bill. By the way, down here I thought I was nothing but a redblooded, clean-living young America boy, but I discover that I'm a supplier to pirates, when I got here.

The nice thing about working with optical disks is that they're shiny, and if the audience begins to go to sleep you can direct the light in their eyes and wake them back up again. [Laughter.]

The optical disk is really an omnibus medium. I tried to call the Sony disk a compound data disk, and the public relations department said, no, you can't do that. But it is truly a compound data device, because the disk I have in my hand has analog video, the kind of video that you're used to seeing on your TV screen. It has digital audio information on it. It has digital computer data on it. It's got analog audio, digital audio, all of these things. And they're all accessible. They're very rapidly accessible.

The farthest point of any piece of information on the disk is less than six seconds away. So that, for instance, with the little compact disk that the people from Magnavox showed you, you can store 550 megabytes of data. The information there is never more than a second away. On this disk, we can store a gigabyte, or a thousand million bytes of data.

I don't know much about the law myself, but I daresay that this disk can hold all that all of you know about the law on the one disk. [Laughter.]

It has incredible storage density. When we couple this—the reason probably that the video disk was a marketing disaster for some companies was that we tried to make a new technology do an old job. We tried to simply transport movies with it, when in fact it is—another acronym coming up—a ROM, a read-only memory.

The disks cannot be erased, they cannot be altered. They are in fact—if the data on them changes, then the disk becomes valueless. But they're very inexpensive. They're made of a very medium-expensive plastic, polymethylmethacrylate. There are about 15 billion impressions in the disk surface, and they're all discrete and they're all identifiable.

When we tie with ROM to a computer, we can—it's just—the number of things we can do with it, I've said often, most of the applications for the video disks haven't been thought of yet. And a magazine editor immediately asked me what those appplications were. [Laughter.]

The equipment that I brought along to show you what you can do with a ROM of this size tied to a micro computer is in the next room. And I'd rather let the equipment do the talking. And so, thank you very much.

Mr. LEIBOWITZ. In terms of mechanics, for the rest of the afternoon, we have an hour and a half remaining before we need to break so we can get ready for the reception and the dinner.

But we have set up in board room three, one, in meeting rooms B and E, the same area where we went this morning for demonstrations, the equipment that you've heard described to you this after-

noon, a demonstration of the Control Data Plato system in board room three, the other equipment that wasn't D&E is there.

There is also in the atrium area Myer Kutz with a demonstration of online data base access. And outside board room D and E is Bill Tauskey from Visicorp Corporation to show you how you can copy copy-protected, so-called uncopyable, computer software. And to explain to you a little bit about what software is, that you've heard so much about.

INTRODUCTION OF SPEAKER

Mr. KEPLINGER. I wanted to say a few words on behalf of David Ladd, the Register of Copyrights, to thank everyone for their participation, to thank Members of Congress for their participation in this session, and for asking us to organize this program for you all.

This evening, we're privileged to have a very fine dinner speaker who will be talking with us further. And there are three of us in the Copyright Office who have worked on organizing this program who are here this evening, David Leibowitz, who many of you know, myself, Mike Keplinger, I've talked with many of you on the telephone about organizing this meeting, how to get it going, and Harriet Oler, who has played a very important part and is a very significant contributor to our team effort that helped organize this whole program and got it going.

[Applause.]

And all of the other people in the Copyright Office too, who have been supporting us and working with us and helping get this program going for everyone. So we've asked Harriet this evening to introduce our dinner speaker.

Harriet?

Ms. OLER. It's really easy to organize a conference such as this one with such nice cooperation from everyone. And I want to thank you in turn for your wonderful cooperation.

Our speaker this evening, Dr. Martin Greenberger, has asked me to give brief introductory remarks, which I will do because I know you've heard a lot of dialog today, and what we're really interested in is hearing Dr. Greenberger's speech.

My briefness in no way denigrates his significant accomplishments. He is the IBM professor of computers and information systems at the University of California at Los Angeles. And he's the author of numerous books on science policy issues, including one written about 20 years ago called Computers and the World of the Future, which presages many of the issues which you all have come to discuss today.

He's currently working on a project involving electronic publishing and the intellectual property concerns raised by electronic publishing. And I think his background makes him a particular appropriate speaker for our symposium on copyright and new technology.

Without further ado, I'd like to welcome Dr. Martin Greenberger.

DINNER SPEECH

Dr. GREENBERGER. Thank you very much.

THE LONG-RANGE FUTURE IMPACT OF COMMUNICATION TECHNOLOGY ON SOCIETY

To introduce the subject of computer systems, I shall report on a conversation overheard in the Garden Restaurant last night.

These four professional women were sitting at a table in the restaurant talking about their careers, making comparisons. After awhile, it got a bit competitive. They started challenging each other on how far back their professions went—claiming seniority, as it were.

The first woman was a lawyer with the Copyright Office. She dated her profession to the practice of Roman Law before the start of the Common Era. This, she enthused, was the very basis of modern Civil Law. She buttressed her claim with references to the Code of Law of Hammurabi in Babylonia, a millenium earlier still.

The second woman was a physician. She spoke of the work of Hippocrates and Aristotle, and the perceptive investigations into human physiology and anatomy in ancient Greece during the third and fourth centuries B.C.E. As the the Laws of Hammurabi, she pointed out, they provided a code of medical ethics and designated a fee schedule for surgical procedures. And, to leave no doubt of her profession's precedence, she cited ancient Chinese medicine still another millenium before, with its theory of the circulation of the blood and the vital function of the heart, along with its detailed understanding of the proper points for acupuncture.

Then they turned to the third woman, a member of the House of Representatives. Hesitating and somewhat bewildered, the Congresswoman gradually began to speak in a candid way about the early years before her life took direction. With her courage mounting, she braced herself, then admitted to having pursued for a short time the calling commonly known as the *oldest* of professions. Silence fell over the group, whether out of embarrassment or simply because the Congresswoman's trump card clearly seemed to have won the contest.

The awkwardness ended as the fourth woman spoke up. She was a computer scientist—a systems analyst. "At the very start of Genesis," began the final contender. "it is written that God created the world from chaos." Suppressing a smile the computer analyst asked, "Who do you suppose created the chaos?"

THE COMPUTER

My talk this evening on "The Post-Print Society" could be subtitled "Computer/Communications as an Environment for the 21st Century." I do not mean to suggest by the title that print will be passé in the 21st century, anymore than I think Daniel Bell meant that industry would be obsolete in his post-industrial society. I simply submit that the emerging electronic emphasis in the way information is collected, composed, and distributed could become dominant in the next century.

By the way, Daniel Bell is writing another book on the significance of technology. He has been looking for a name to apply to the current era: computer, electronics, information, telecommunications, teleprocessing? Which descriptor best captures the essence of the times?

My choice would be computer era. The computer has been and continues to be a profoundly fertile concept, intellectually as well as technologically. It promises to transform the environment of all civilized society and set an indelible tone for the foreseeable future.

It is interesting to consider the etymology of a term that connotes a pivotal age in the history of civilization. In Latin "com" means "with" and "putata" has a number of meanings including "think." So the computer is a mechanism to think with. This is a great rendition.

The first computers were not called that. They were referred to as analytic engines, difference analyzers, numerical integrators, and calculators. The computer I started with at Harvard University in 1950, for instance, was known as the Automatic Sequence Controlled Calculator (more frequently the Mark I). It was the first working computer. Its design goes back to 1939. With its clicking electromechanical relays and large banks of externally set switches, it took directions from programs punched with round holes into closed loops of revolving cardboard tape. This unforgettable equipment was in active service from 1945 through the early 1950s.

In those days the emphasis was definitely on calculation. These machines were number crunchers first and foremost. The Mark I, for example, produced voluminous tables of mathematical functions day-in and day-out, week-after-week, year-after-year.

Times have changed. Today, everyone realizes the computer has far broader and deeper connotations than originally recognized, going well beyond numerical calculation.

There have been five generations in the history of automatic computers, not counting museum specimens like that the Mark I. The first computers in the modern sense of the word, such as the Electronic Numerical Integrator and Calculator or ENIAC at the University of Pennsylvania, used electronic tubes. The Univac was the first such machine to be made commercially available.

The second generation came with the invention of the transistor. This was a big step forward. Transistors offered a much more satisfactory means of storage and logic. The third generation arrived with the introduction of printed circuits. Transistors were printed or etched on pieces of silicon. Such fabrication lent itself to mass production.

In the fourth and current generation, printed circuits have reached an advanced state. Circuits are being integrated onto chips with very high densities. This is known as VLSI.

People are now speculating on the fifth and even sixth generation. Fifth-generation computers, called knowledge information processing systems, will be endowed with expert knowledge. Present-day computers are serial machines. They basically perform one task at a time. Fifth-generation computers will be more humanlike in function. Their parallel architecture will enable them to do many things at once, roughly in the manner of the human nervous system. This could greatly improve the speed, capability, and versatility of automatic computation.

With sixth and future generations, computers will function more like biological systems, using biological storage and optical technology for logic and transmission. Computer technology has not reached the end of the road in any sense. Viewed retrospectively a

hundred years from now, the late twentieth century may be regarded as just the beginning in the evolution of computer systems for control and communication.

THE CHIP

One measure of the progress already made with computers is the quantity of integrated circuits being packed onto a chip. Circuit fabricators currently compress 600,000 transistors on six millimeters (a quarter of an inch). Even as these 256k RAM chips are beginning to become commercially available, companies have already begun work on one megabit chips with four times the storage capacity.

The packing density has steadily improved since integrated circuits were first developed by Texas Instruments and Fairchild back in 1959. Each year from 1959 to 1973, densities doubled. They have been increasing at a rate of one-and-a-half times per year since 1973. Inasmuch as logical elements can only be so small and so close together, this constant improvement eventually must subside. Nevertheless, one billion transistors per chip is being projected by the end of the century.

As densities have increased, prices for computer chips have come down dramatically. In addition, the size of memory elements has grown from 8 to 16 to 32 bits. However one gauges it, progress has been quite remarkable. In coming years, there will be other breakthroughs and advances, each one outdoing its predecessor if patterns of the past are repeated.

Every step forward in computer technology has had an impact on society. Technological advance is a driving force and an impetus for change. But the effects are not just in one direction. Progress in technology is itself determined and modified by complex social forces interacting with political and economic interests finding expression in customs and contracts, legislation and law.

An obvious illustration is the set of regulations affecting patents and copyrights. One might find it curious that copyright has been asked to play such an active role in the development of chips and software. It is certainly ironic that the very technologies whose ramifications have most upset traditional copyright practice are themselves objects of copyright protection.

Chips and computer software are new forms of intellectual property. They are not at all the sort of product of creative endeavor the original framers of copyright legislation had in mind. Neither technology has yet been well defined or satisfactorily incorporated within existing procedures, despite the extensive use made of copyright by their designers and suppliers. These technologies need protection, but in a manner suited to their peculiar characteristics and to the critical roles they play in the manufacture and application of computers.

PERSONAL COMPUTING

Software has been vital to the development of computers from the beginning. In certain periods, the growth of software has been nothing short of explosive. The most recent such occasion was

during the rapid commercial rise of personal computers during the first half of the 1980s, an episode amply covered by the media.

Only a few years ago, strategic planners in the computer industry were first proposing commercial production of personal computers. The idea was innovative and controversial to the large computer companies at the time. Market prognosticators were trying to sell the concept to management by forecasting sales in the thousands of machines a year. Their projections, viewed as much too high, met with considerable scepticism.

The record is that actual sales exceeded forecasts by several orders of magnitude. Revenues grew by factors of five in three successive years. The forecasts were essentially surpassed before the ink was dry.

Upwards of ten million personal computers now reside in homes and offices throughout the country. The number is expected to continue to grow significantly, if sporadically, in future years, with as many as one out of three households projected to have some kind of personal computer by 1990. There may eventually be as many personal computers as TV sets nationwide.

One sign of the quick eruption of personal computers is the amount of venture capital going into microcomputer-related fields as compared to other fields. In 1980, the energy and energy-related sector received about 20 percent of venture capital. One year later it received less than six percent. In 1980, computer-related industries received about 26 percent of venture capital. The following year they received 34 percent, over a third of all capital made available to new companies. Much of this capital went to firms producing either personal computers and especially software these firms need to round out their products and secure a foothold in the marketplace.

The software business requires only modest capital investment to get started. In addition, its main resource is talented and creative people. For these reasons, the business tends to be individualistic and innovative in nature and has typically been independent of the mainframe computer business. Large computer companies often do not manufacture their own software. Instead, they go outside to contract for it. IBM arranged with Microsoft to obtain the operating system for its personal computer. Companies like Microsoft are doing very well. Some starting quite small have experienced phenomenal growth.

The nature of the computer hardware and software industries may change in time. Once personal computers and computer work stations begin to saturate the home and office market, the dynamic growth historically experienced to computer hardware is likely to shift increasingly to software, as current trends already confirm. The result is that giant companies in computer hardware are going to want an increasing share of the software market to sustain corporate growth and reach ambitious revenue objectives. Computer programs for data services, electronic transactions, and entertainment may become to the computer industry what electrical appliances have been to the electric power industry. Companies like IBM will want to be prominent participants in this business of computer appliances. They will strive to be masters if not manufac-

turers of their own software. They will build their own operating systems and a widening variety of application programs as well.

THE NATURE OF SOFTWARE

The term "software," now in common everday usage, did not even appear in Webster's Unabridged Third New International Dictionary when it was published in 1961. It is perhaps not suprising that society would hesitate before accepting the name or even the idea of a form of information and intelligence that could not be read, understood, or made intelligible in the manner of the printed word, the standard for recorded knowledge.

In earlier days, there had been a tendency to speak of programs as literary works. This they clearly are not. The functions they perform and the purposes they serve are much more utilitarian and operational than literary. The use and usefulness of a program—its hallmarks—are not generally to be discerned from a reading of the code. In fact, the value of the program may not become apparent without extensive explanation, documentation, and first-hand experience in its operation.

Another difference between programs and literary works is the significance of copies. It is worth pointing out that one can use a program as one's own without copying it electronically. All one needs is ability to operate the program. A password allowing file access to another person's copy will do just fine. Assuming the owner has given approval, no law is broken by such use, ownership does not change hands, and no harm or modification occurs to the program.

On the other hand, copying is very easy and inexpensive with software, so easy and inexpensive that it seems futile and even counterproductive to attempt to prevent it. Society has been conditioned to think of the act of copying as a central issue in the effort to protect creative works. This may not (or should not) be so with software. The significance of copying must be rethought in the changed context of this nonprint electronic medium.

The set of instructions incorporated in software is an embodiment of basic ideas as well as an expression of specific elements and interconnections. For this reason, software protection has tended to fall between the cracks—between patents which cover new processes and ideas, and copyright which covers original expressions. Copyright has become a primary instrument for protecting software. Still, software is not well covered by copyright law at the present time despite the considerable accommodations made.

To some people, the simplest solution is not to bother protecting software at all. Let a thousand flowers bloom. Avoid the kinds of concentration and competitive advantage that the monopoly rights awarded by copyright foster. Promote free and universal access to software. Preserve ease of entry for new producers.

Despite their merit, these arguments tend to overlook certain realities. Protection is seen as necessary in the software business for two principal reasons. First, creativity is a very important resource of the business and should be encouraged. Such encouragement has traditionally taken the form of ample economic rewards. Second, the infrastructure of the software industry needs to be more fully

developed. A young and dynamic industry requires a high level of marketing, support, and stability for continued growth and prosperity. Such growth, it is maintained, will not occur without the protected investment made possible by copyright privileges.

The effort to protect software—and chips as well—is greatly complicated by the fact that it is so easy to copy them. Their research and development costs, and the costs of building markets for them, are much higher by comparison. It may cost a company $40 million to develop a particular chip, and another $40 million to create a market for it. It is not fair to allow a second company to copy the chip at minimal expense and raid the market promoted by the first company without incurring any of the development costs.

GENERATIONS OF SOFTWARE

Computer software like computer hardware has evolved through a number of generations. With microsoftware for personal computers, the generations have succeeded each other with great rapidity. Since the market lifetime for a particular product may be extremely short, software development costs can present a major problem.

By one means of accounting, there have already been five generations in the development of software for microcomputers. The first generation consisted of customized microsoftware programs designed by home computer hobbyists back in the late 1970s. These hobbyists were playing with computers like ham operators play with radios. They wrote programs in languages like BASIC, FORTRAN, and assembly code. The unique characteristic of the first generation of miscrosoftware was that it was composed solely by users.

The second generation began with the appearance of microsoftware firms. Their business was packaging programs with specific functionality. Now users did not have to know a computer language. They had only to press buttons, as on a washing machine, and the computer would go through its paces. This was a great advance. Computers were becoming much more accessible to the general public. User-friendly is the way it was put.

The premier example was VisiCalc, a spreadsheet program developed by a Harvard Business School student while doing a project for one of his courses. He recognized that his program had general applicability and proceeded to produce a commercial version of it. VisiCalc was the best seller among packaged programs until Lotus 1-2-3 succeeded it. The rousing success of the microcomputer industry has been tied to the popularity of second-generation programs.

The third generation of microsoftware consisted of families of individually packaged programs. VisiCorp, the company that marketed VisiCalc, began to announce programs for word processing and database management with names like VisiWord and VisiFile. But the exchange of information between programs within a family tended to be clumsy and ad hoc. They were a family in name only.

Interest began to be focused on programs that combined several functions in a single framework. The idea had been pioneered at Xerox's Palo Alto Research Center (PARC). The Xerox Star system emanated from this work, and Apple's Lisa system (LisaCalc, Lisa-

Write, LisaList, LisaDraw, LisaProject, LisaGraph, and LisaTerminal) borrowed from it heavily. Lisa is the older sister to Apple's Macintosh computer, a current favorite in the marketplace.

Such systems provide the ability to display several windows simultaneously, a handy feature to which many users became attached. For awhile, VisiOn was though to be the windowing environment that would sweep the marketplace. VisiCorp looked for it to be its next major commercial conquest—the product that would assure the firm a leading place in the field. Because of delays and other problems, this did not happen.

The current fourth generation of microsoftware consists of integrated software. Programs are now more smoothly engineered so that interconnection between functions is less cumbersome, if still not trivial. Lotus Development Corporation integrated data management with the spreadsheet function in its very successful 1-2-3, then parlayed its gains with Symphony by adding word processing. Ashton-Tate, supplier of the well known D-BASE data management programs, came out with Framework, a direct competitor to Symphony.

Systems such as Symphony and Framework are highly sophisticated and esoteric to most people. Yet software companies have felt the need to advertise them aggressively to gain a competitive foothold. The marketing budgets of the leading software companies are unbelievable. Some annual advertising expenditures are larger than the revenues of the same companies just a few years ago.

In the fifth generation, individual computers and computer users will be communicating with each other and sharing databases over local area networks. Fifth generation microcomputer software will make the network mode convenient and economical, allowing organizations to deal with multidimensional problems interactively.

In a large company, functions like finance, marketing, production, and personnel are typically the responsibility of different departments. Fifth-generation software will link such departments and functions, enabling needed information to be shared, compared, jointly accessed, and maintained in a decentralized fashion.

In the newspaper industry, modern computerized news editing systems already permit the entire newspaper to be produced as a single database within an integrated framework. Reporters compose articles, editors review these articles, electronic copy comes in from wire services, classified ads are entered—all as electronic files maintained within the same computer system. Writers and editors at dispersed terminals have access to this detabase with different levels of access that reflect the structure of the organizational hierarchy. Such integrated operation over local area networks will become more commonplace as fifth-generation microsoftware is perfected.

SOFTWARE PIRACY

With the commercial rewards so large and copying so easy, piracy is bound to be a problem with software. There are three types.

The first, which really should not be called piracy, is committed by hobbyists working at home. It has a long tradition. The practice

reminds me of the way we used to trade baseball cards with other kids on the block. Your friend had two Joe DiMaggios; you had none. But you had two Ted Williamses and he had none. So you swapped cards to make both packs more complete.

The difference with computer programs is that you can make a copy of your program easily without losing the original. You give it to your friend and now you both have copies. The activity is widespread, both among individuals and within user groups. It has been going on for some time. Many software companies dispair of any official means to control it. Society is for the most part ambivalent about this type of piracy. In considering preventive measures, we must take account of what society frowns upon and what it accepts.

The second kind of piracy is more organized. Often commercialized, it can take the form of out-and-out fraud, as when somebody copies a program, repackages it, and sells it without making any changes. This is clearly wrong and should be prohibited.

But situations are not always that straightforward. The program may have been altered by manipulation, or it may have been incorporated into a larger program. In the least offensive case, not considered piracy, only the idea of the program may be borrowed. Lotus 1-2-3, for example, is an improved, expanded version of VisiCalc. Its creators do not pay royalties to the proprietors of VisiCalc, nor are they infringing on anyone's legal rights under copyright law. Copyright protects expressions, not ideas.

The third form of piracy can occur in a large organization with many microcomputers. In a particular aerospace company, for example, one group of engineers has 150 PC's assigned to individuals or pairs of individuals. The engineers working on similar projects use the same programs. Should the company be required to buy a copy of each program for each microcomputer? This could run into tens of thousands of dollars per program. Why should the engineers not share programs over the company's local area network as they share databases?

The way to deal with this third kind of violation is to appeal to the business ethics and sense of responsibility of the using organizations. Both sides can agree that it is reasonable to assign more revenue to the software producer in such instances than the price of just a single copy. Compromise and accommodation are possible through licensing arrangements and group pricing.

PROTECTION

How is the software industry responding to the problem of piracy? Copyright by itself cannot be the total answer. Difficult to enforce, it most frequently goes unenforced.

As one approach, the industry is resorting to technology to make copying difficult. For example, a chip can be embedded in a microcomputer with a unique serial number. For a program to run on the computer, it must have the same serial number. If a copy of the program is put on another computer, it will not work. Such forms or technological obstruction might be called "software locks." The trouble is, they block the ability of programs to be shared between computers and computer users for perfectly legiti-

mate purposes. They may inconvenience the authorized user more than the would-be thief.

Another approach is to make a program available from a large host computer that can maintain control of its use and charge accordingly. Or there are ways of metering the running of a program by inserting a monitoring device in the hardware, or in the software, or both.

Still more inventive is a scheme called "weak bits." The idea is for a pattern of bits within a program to fluctuate randomly. Bits with this characteristic cannot be reproduced to operate in the same way with a copy of the program. But the program will not run unless they are present.

A related device is a set of bits modified with each use of the program. As with weak bits, these changing bits must be present, but are not part of the operation being performed. They ultimately self-destruct after the program has been run a prespecified number of times.

Another notion called the "dead bolt" is a piece of hardware that the user must buy along with the program. The attachment hooks into the computer and must be activated before the program will run. It is obviously not something users take to very enthusiastically.

Yet another approach is the warning label stating that a given program must be used on the designated computer, or that it is produced by such-and-such under the following restrictions. Like the label on a mattress, it is prohibited from being removed under penalty of law, and affixed to the program for its life.

Labels and other identifying elements can be hidden electronically within a program to help in detecting piracy and waging a law suit. The electronic marker found in a suspected copy of a program provides legal grounds against the copier.

The ingenuity does not stop with the inventors of such technological tricks. It just begins with them. A counter-culture has arisen. "Locksmiths" form a sub-industry of clever individuals who seek to unlock or defeat these protective devices and technological safeguards. It is fair to say that no one has yet developed a software lock that cannot be broken. It is like the arms race. The lock designers makes a technological advance, then the locksmiths outdo (or undo) them. This induces creation of still more sophisticated measures and countermeasures.

CONSUMER PERSPECTIVE

Copy-protect devices may continue to proliferate with ever-increasing effectiveness, yet it is the marketplace that may have the deciding vote. Consumers are likely to reject programs with limitations on their ability to be used freely. A restricted program will not be as attractive to consumers as a competitor's alternative that is free from inhibiting controls. The preference of users for less restriction may eventually undermine the marketability of copy-protected programs.

Why is there resistance to protective mechanisms? People who buy a program want full access to it. They want to be able to look it over, learn from it, and adapt it to their needs. Protective devices

prevent this. They do not allow pieces of one program to be incorporated into other programs. They inhibit the free exchange of programming knowledge and the building of ever-larger software structures. They impair creative flexibility. This flexibility is very important to the health and progress of the software industry. Without it, it seems unlikely that the industry will be able to reach its ultimate potential.

Some believe that once a program has been written and bought, it should be available for all to see and use. This view, considered maverick if not naive by copyright lawyers and other proponents of traditional restrictions, would have software producers spurred on to greater challenges by a process of full revelation. The mavericks regard concerns about piracy as excessive and paranoid. The more the program is known and shared, they say, the better its sales will be—and the better the public will be served.

The consumer has practical concerns. A program may crash and have to be replaced. It would be convenient to be able to supplant it with a copy of a friend's program. Instead it may take three weeks to get a surrogate copy from the supplier. Or the consumer may want to shift or adopt the program to a newer computer. Protective devices generally make this impossible. If the program has a problem, how is it diagnosed? Suppose the program does not load? How does one know what is wrong?

So copy-protection can alienate consumers and be detrimental to the acceptance of a program in the marketplace. Critics of copy protection point to the example of the WordStar program of MicroPro International Corporation. All through the first part of its life, it was never copy protected. Yet it has been commercially the most successful of word processing programs.

When MicroPro came out with its WordStar 2000 improvement recently, a columnist about to review the new version discovered to his chagrin that a copy protection feature had been added. This made the program incompatible with the hard disk attached to his personal computer. Rather than proceed with his review, he used his column to complain about copy protection devices and announced he would not review WordStar 2000 until he could use it with his hard disk. Many readers wrote in that week agreeing and lending support. Not long thereafter, MicroPro distributed a press release dropping the copy protection feature.

AN ECONOMIC APPROACH

Perhaps copying is not the real issue. There are other rights to consider besides copyright, such as access right and service right. Copies are not the only, or even the main things vendors are selling. They are also selling service and support. The large gap that exists between the price of a program and the cost of copying it is accounted for in large part by the need to advertise and distribute, and to provide customer assistance, documentation, updates, and dealer support.

This suggests another approach to the piracy problem. Instead of making it more difficult and expensive (legally as well as technologically) to copy, software suppliers might instead seek to reduce copying by increasing the value of the original. That is, they can

make the service and support features of the product a more explicit and dependable component of the purchase agreement. This would be an approach to the problem of copying through the marketplace rather than via technology or the courts.

There are numerous ways of increasing the value and attractiveness of the original. These include special keyboard templates, charts, and user aids packaged with the program; a user manual that is well written and physically appealing; and a continuous stream of updates, customer guidance, and improvements available through the software dealer. In the final analysis, customer service may be what most people really will be purchasing

A more direct economic approach is to lower the price of the original. Reduction in software prices has already begun to appear and should be fostered by increased competition in the industry. Diminution of the economic incentives for copying may well reduce its incidence significantly. So predicts the chairman of Apple Computer.

APPLYING COPYRIGHT TO SOFTWARE

Insofar as copyright is resorted to as a means of protecting software, three traditional requirements must be considered. Subject for copyright must customarily possess originality, fixation, and intelligibility. Originality certainly has a role to play. We do not want to be protecting programs that add nothing new. Originality is the least that must be asked as grounds for granting the privilege of protection.

As for fixation, this traditionally requires a tangible medium which electronic communication is not. So new definitions are needed to replace the conventional conditon for fixation.

With respect to intelligibility, in a precedent-setting case many years ago, a piano roll was judged unsuitable for copyright protection because it was not readable. Object code in computer software is not readable, yet most would agree that it deserves protection. Similarly, the design of a computer chip warrants protection, even though one cannot understand the design just by looking at (reading) the chip.

Assuming copyright protection suitably modified and redefined is to be applied routinely to software, there arises the issue of user fees. There is no charge to read a book, watch a video cassette, or listen to a record borrowed from its owner or the library. Should there then be a charge to use a program made accessible to the user by its purchaser?

A different answer may apply to information retrieved from a data bank. It is not unusual for an original purchaser of data to add value to it through compilation and analysis. Such intermediation can be the basis for very productive and useful businesses. The rights of the compiler or analyzer of data must not be ignored in the haste to uphold the rights of the original source or those of the ultimate user.

These are some of the issues that must be re-examined in any serious attempt to apply copyright protection or find other viable approaches for safeguarding the new intellectual media.

Ithiel de Sola Pool thought about these problems a great deal. He defined the concept of bottlenecks of production and distribution where controls could be imposed, and drew attention to the need to identify such bottlenecks for the new media. In print publishing, there is the printing press. The copies coming off a printing press are tangible and countable. The machines themselves are large and relatively few in number. They provide conspicuous points for exerting control. Similarly, large studios and manufacturing plants are key, highly visible points of activity in the case of records, movies, and videodiscs. They also lend themselves to the introduction of control.

What will be the activity points and bottlenecks for the post-print society? Much of the confusion stems from the inability to identify them clearly at the present time. The medium is changing rapidly. There are few solid anchors. Copyright, rooted in print, is in danger of becoming a Rip van Winkle in the era of the electronic computer.

With computers, publishers lose control. Even the hard copy count of copying machines is no longer available. Electronic publishers and distributors of electronic data have no satisfactory means of tabulating the number of times non-tangible copies of their material are used, displayed on a VDT, or printed out in hard copy form. Every personal computer and every computer printer is a potential copying machine. The problem will get worse as computer memories using VLSI chips become larger and cheaper, and as network interconnections for users expand, becoming more streamline and more simplified.

Some people believe that the way to deal with the increasing problem is through indirect rewards and non-market means of compensation. In other fields, painters do not get royalties each time their paintings are sold and displayed by the owners of the paintings. They are compensated through fellowships, prizes, and private funds. Scientists and scholars are not remunerated each time they contribute to their discipline. They receive honors and promotions at their universities, as well as consulting and lecture fees.

University projects and research laboratories typically work without royalties, and libraries in other countries pay a flat fee for the right to provide unlimited copies to their users. In the United States, cable systems pay to gain unrestrained access to distant signals. Such precedents may provide the elements from which to forge appropriate solutions.

The new computer-communications environment has a great need to incorporate simple information systems into larger intergrated systems. Mechanisms for protection should not be allowed to impede this vital constructive process. There should be innovative ways to think about protection and compensation in the context of linkages between software and user functions. Such linkages are appearing more all the time with banking, shopping entertainment, legal assistance, health care, and a wide variety of other business and consumer services.

Within the linked information structures, directories are likely to gain increasing prominence. The computer-communications environment of the post-print, information-abundant society will require them. Created to identify services and indicate where they are available, directories could provide a key bottleneck or activity point from which to apply controls.

Directories are but one type of facilitating function that will be emerging in growing number. It is good policy to encourage the development of such value-added services. They could become a principal avenue for reimbursement and royalty payments.

CONCLUSION

These, then, are some of the key issues that need to be considered. First, the idea of intellectual property must be re-examined in light of the purpose and nature of such works of technology as software and chips. Second, the significance of copying should be rethought. Third, the role of services and support in the marketplace must be recognized, and the possibility of invoking these functions in providing protection and compensation should be fully explored. Fourth, the boundless versatility of technology should be employed to develop new mechanisms for assigning monetary rewards to access and use.

One final issue that deserves mention has to do with the period of protection traditionally offered copyright holders. Because of the dynamic nature of the computer industry, 15 years, 17 years, or the life of the author may not be appropriate. For software, a much shorter period is probably all that is required. Three years may be more than adequate.

Overall, we need to look at the purposes the new media fill and the interests served by compensation and protection. In doing so, we should not be bound by the precedents of copyright and patent law, even though the social and economic objectives underlying these laws may guide us.

The ascendancy of the computer parallels the ascendancy of knowledge workers in society. Today, over half of all working Americans are directly involved in the processing of information. The proportion increases each year. Knowledge workers may be likened to farmers and factory workers in years past. Farmers were aided by harvesting machines, manufacturing workers by heavy industrial machine. Knowledge workers are being aided by the computer.

The computer was fully inducted into society in 1982 when Time Magazine named it Man of the Year. The computer is an engine of change. It is not itself a medium of communication. Rather, it provides an environment for other media. Through electronic publishing, for example, once very different communication media are now merging and emerging in new forms.

Newspapers, magazines, and books once provided almost all of the information available to the general public. Today, they produce less than 18 percent. Americans now consume over four times as many works electronically as they receive in print. Even newspaper and magazine copy is composed, stored, transmitted, and printed electronically.

We are at a turning point in the move to computer-communications. As in 17th and 18th century England, the legal precedents established in coming years are likely to become norms governing information distribution in future decades. This poses an obligation and a challenge. The present generation must think clearly, judiciously, and boldly about the issues and opportunities of the new electronic environment. Wise and innovative legislation is needed for the computer industry to maintain its innovative nature and for democratic societies to preserve their independence and freedoms.*

[Applause.]

Mr. KEPLINGER. Thank you, Dr. Greenberger, for your stimulating comments. At 9:00 we'll resume our program again in the ampitheater with the beginning of our panel discussion to explore the exciting and important policy issues that arise from the technology that you heard discussed today.

Again, let's all say thanks very much to the people who provided very kindly our demonstrations today and Haines Gaffner who provided us with overview for the sessions today.

[Applause.]

[End of proceedings as recorded.]

SUMMARY OF PROCEEDINGS

Day 2: February 5, 1984

A SERIES OF PANEL DISCUSSIONS ON THE FUTURE IMPACT OF TECHNOLOGY ON INTELLECTUAL PROPERTY

Panel Discussion I: Information Processing in the Future—Joe B. Wyatt, Chancellor, Vanderbilt University; Frederick Weingarten, Office of Technology Assessment; Christopher Burns, Executive Officer, Christopher Burns, Inc.; E.C. McIrvine, Manager of Advanced Planning, XEROX Corp.; and Donald Devine, Chief Executive Officer, Trilog Inc.

Panel Discussion II: Publishing, Libraries, and Education—Toni Carbo Bearman, Executive Director, National Commission on Libraries and Information Science; Hon. Stephen Breyer, Judge, U.S. Court of Appeals for the First Circuit; Karen Hunter, Planning Officer, Elsevier Science Publishers, B.U.; Joseph P. Lash, author; Jay Luker, Director of Libraries, Massachusetts Institute of Technology; and Warren Spurlin, Deputy Superintendent, Sarasota County, Florida.

Panel Discussion III: Mass Media Distribution: The Future—Harvey Zuckman, Director, Communications Law Institute, Catholic University School of Law; Bryan L. Burns, Director of Broadcasting, Office of the Commissioner of Baseball; Mel Harris, President, Paramount Video; Gustave M. Hauser, Chairman, Hauser Communications; William Lilley, III, Vice President, Corporate Af-

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*Many of the ideas in this talk are based on the writings and thinking of the late Ithiel de Sola Pool. See, especially, Pool's Technologies of Freedom, The Belknap Press of Harvard University Press, Cambridge, Massachusetts, 1983; also, Pool's posthumous paper on electronic copyright in Martin Greenberger, ed., Electronic Publishing Plus: Media for a Technological Future, Knowledge Industry Publications, Incorporated, 1985.

fairs, CBS, Inc.; and Clyde Washburn, Chief Scientist, Earth Terminals, Inc.

Panel Discussion IV: Administration of Rights in Copyrighted Works in the New Technologies—Paul Goldstein, Stanford University School of Law; Thomas C. Brennan, Chairman, Copyright Royalty Tribunal; Harlan Cleveland, Director, Hubert H. Humphrey Institute of Public Affairs, University of Minnesota, Alexander Hoffman, Senior Vice-President, Doubleday & Co.; John Kernochan, Columbia University School of Law; Paul Weiss, Rifkind, Wharton & Garrison, and George Willoughby, Vice President, King Broadcasting.

Rapporteur's Summation—Paul Goldstein.

Dinner speech—"Trends, Development, and Projections," Frederick Pohl, writer.

MORNING SESSION

TRANSCRIPT OF PROCEEDINGS, FEB. 5, 1984

INFORMATION PROCESSING IN THE FUTURE

Mr. GOLDSTEIN. Good morning, everybody. If we can be seated, we have a very full program today, and the sooner we can begin, the more knowledge we can all gain from the very illustrious group of panelists that we have.

Yesterday, we all had the opportunity to look over the various types of technological devices that are more and more becoming a part of our lives. We then built upon those technical demonstrations with the stimulating presentation last night by Professor Greenberger. And now, we continue that process with four panel discussions focusing on these various issues.

The first panel concerns information processing in the future, and I have the pleasure to introduce our moderator.

Joe Wyatt presently is the Chancellor of Vanderbilt University. Before joining Vanderbilt, he was Vice President of Harvard University and is the co-author of Financial Planning Models for Colleges and Universities. Finally, he also is a member of the Advisory Committee on Information Sciences and Technology of the National Science Foundation. And I think we're all honored to have Joe join us and I'm going to turn the podium over to him now.

Mr. WYATT. Good morning. I will take little of your time except to introduce the panelists very briefly, tell you who they are. I'll introduce each one individually before they speak. Our topic is Information Processing in the Future, certainly a broad and deep topic. Yesterday, we gained some perspective on the topic generally, and we each had an opportunity to gain some personal experience at the demonstrations, a remarkable experience indeed.

The view of the future that will be taken by the panelists is each from his own perspective around the design, development, application, ownership of computer communications hardware and software and, of course, the processing of information. This is an area that has had a brief, robust, and rather remarkable history, and each of these gentlemen has a view on it that I think you will find most valuable.

The panelists are Christopher Burns, Executive Officer of Christopher Burns, Incorporated; Donald Devine, Chief Executive Officer of Trilog Incorporated; Ted McIrvine, Manager of Research and Development Planning in Xerox Corporation; and Frederick Weingarten, Program Manager of the Communication Information Technology Program at the Office of Technology Assessment. We will have each of the panelists speak for about ten minutes, and after that we will have a discussion, entertaining questions from you and from the panelists.

Our first speaker on this panel is Rick Weingarten. He is now Manager of the Communication and Information Technologies Program at the Office of Technology Assessment. Before that, he was Program Director in the Computer Sciences Section of the National Science Foundation, Director of Computing Services for The Claremont Colleges, and has worked at the Lawrence Radiation Laboratory in the Jet Propulsion Laboratory. He has a bachelor of Science degree in engineering from Cal Tech and a Ph.D. in mathematics from Oregon State.

Rick?

Mr. WEINGARTEN. Thank you, Joe. I want to first thank the Copyright Office for inviting me to speak here. I must say that as a staff member of a Congressional agency, I feel it more appropriate that I sit out there and learn from this meeting than sit up here and play the role of expert. I assume that the reason I've been asked to talk is that the Office of Technology Assessment has been asked by both the House and Senate Judiciary Committees to do a study of the impacts of information technology on intellectual property law. We are currently formulating a proposal that we expect to go to our Technology Assessment Board, of which Senator Mathias is a distinguished member, in about a month.

Now, at that stage of the process, we're not worrying about answers. We're not even thinking about answers. What we're worrying about are the questions. How does one think about the relationship between information technology and intellectual property law? The linkage is not direct. Copyright law, patent law, are not technology laws as such. They deal with something different; they deal with something abstract, intangible.

At the same time, it's very clear that technology is a major force raising critical issues for these committees.

So I would like to spend my time talking a bit about the question stage, exploring how we think about the relationship of technology to intellectual property protection. The first point I'd like to make is that somewhere in between the technology that you heard about yesterday and will hear more about today and explored in the exhibits, and the law and the policy issues that we're grapping with, is an intermediate step. There are a number of institutions, market organizations, and cultural values, that affect the way the technology is used, which in turn affects the kinds of stresses that are placed on the system of intellectual property protection.

Let me go back a little bit into history to illustrate that. Currently, as you heard last night at the banquet speech, the protection of software is of major concern to the software industry. Well, 30 years ago, when computers were first entering the marketplace, software was free. IBM and the other computer manufacturers

gave software away if you bought their machine. Users, faced with these complex, new, incomprehensible devices, were left on their own to develop the application systems that would make the computers do the work they wanted them to do. And, in response, a cultural social value of sharing, or cooperative effort, arose. In fact, the IBM users group was called "Share." Programmers from computer centers would get together, exchange code, and exchange tips and ideas on how to develop the software packages that were needed.

In the 70s, two key events occurred to change that picture. In early 1970s, the Justice Department told IBM that bundling the software together with the hardware was in violation of antitrust, so the "unbundling" decision that took place in the early 1970s separated software out as a commodity that was sold by IBM or by any other manufacturers along with the hardware.

The second event took place in the 70s and early 80s. This was the explosion of the micro computer market. Instead of a market of a few thousand, we had several million computers out there. And most of those computers now use software that is purchased from retail stores or mail order or whatever.

Suddenly, there's an entirely different process of exchanging computer software in our society, and it's that new process that creates the demands for protections of that as intellectual property, and I would submit that it's the conflict between this new marketplace and a deeply held tradition of sharing in the programming and computer community that's causing some of the problem that we have labelled "piracy" recently.

But this is also an example of how it's not the software technology that creates intellectual property problems, its the way that technology is used and brought into the marketplace.

It seems to me that there are five questions we ought to ask about any technology, five characteristics that we need to identify in order to understand how it's affecting intellectual property. 1) How will it affect the creation of information products, 2) how does it affect the marketing of information products, 3) how does it affect the distribution and dissemination of those products, 4) how does it affect the use, and finally, 5) how does it affect access—the public's access to information. I don't think there's anything magical about those five categories, but I'll throw them out as something to at least think about.

Let me give you examples of each of those five categories. In the creation of software, software engineers are working as hard as they can to find tools that can be used to shorten the step between the conceptualization of a piece of software and its realization in a program. Now, artifical intelligence experts tell us that within a decade they'll have what they call "expert systems," which will provide intelligent help, guidance, from the computer to the programmer or to the person trying to develop code to produce more sophisticated information products. That may have strong effects on what the producers of these programs need to have protected.

If it's a simple and very economic step to move from the original concept to a new program, rather than the laborious, time-consuming task it is now, then protecting the end product may not protect

much. There may be increasing pressure to protect the idea rather than the product, which raises enormous ramifications.

In the area of how technology affects the market, broadcast television has developed a system, which is a very profitable business, distributed for free. This system is partly driven by the nature of broadcast technology. Once the program goes out from the antenna, the producer or seller of it no longer has any control, so there's no way of getting a return; in the past there was no way technologically of getting a return from the recipient. The system of advertiser support in some sense had to develop to compensate for this technological limitation.

New technologies are changing that. They will allow the producers and disseminators of information to control it much further along the path of dissemination. That may have ramifications on intellectual property law.

How does the technology change the way information is disseminated? One of the trends in the technology is towards an international communication system. For example, satellites don't observe national boundaries very well. On another front, engineers are interconnecting all communication systems in the world together into one single network. Those trends create stresses on the international copyright agreements between nations, as I'm sure we're all aware.

The video cassette recorder is an example of how technology affects the way information products are used by the person who receives them.

And, finally, we come to the question of access. I don't have a good example of this, except to point out that the three major mass communication media in the past: radio and television broadcast, newspapers, telephones have all provided us as a society with what is equivalent to "universal service," service that is either very low cost or free.

Some of the new technologies coming along, like videotext, appear to be focusing on very narrow and very high income markets. If that's true, it may be that the new communication and information media in the future will increase the gap between those who have access to these products and those who don't. To the extent that intellectual property law draws some of those boundaries, or referees in that marketplace, I think it's an important effect to consider.

Well, any scientist knows that you are 90 percent on the way to answering questions if you can identify the proper questions to ask. And I think that's the stage we're at in this area now. And I would encourage everybody, as they listen to the technological descriptions over the day, to think in their own minds what the characteristics of the technology are that are going to affect the policy.

Thank you.

Mr. WYATT. Thank you, Rick. Our next speaker, Chris Burns, is President of Christopher Burns, Incorporated, a research and development consulting firm specializing in business development issues within the information industry. He was previously Senior Vice President and Associate Publisher of *Minneapolis Star and Tribune*, Vice President of Planning for the Washington Post Company, and a senior consultant at Arthur B. Little, where he directed

much of that firm's research and consulting in the area of new technology and its impact on the media. He is a former member of the Board of Directors of the Information Industry Association, former chair of its Proprietary Rights Committee, and former chair and member of the Planning Committee of the Board.

Chris?

Mr. BURNS. Thanks, Joe. The information industry whose concerns I've been asked to comment on this morning consist of creators, distributors, and publishers of information for scientists, economists, financial analysts, lawyers, credit managers, market researchers, and other professionals, primarily through looseleaf publications, newsletters, special reports, and a variety of electronic information services.

In 1983, revenues for this sector of the economy were about $12½ billion, larger than either books or magazines, about the size of the whole television industry, half the size of the newspaper industry, and growing twice as fast as the economy. Although this activity is an old one—as a matter of fact, Abraham Lincoln was a credit reporter for Dun & Bradstreet—it's the most modern of the media, the most aggressive in its use of new computer and communications technologies, and the perpetrator as well as the victim of much of today's copyright confusion. We're the ones who, having successfully pried the expression free from traditional books and pamphlets so that it could be sold more efficiently, are now learning to extract the pure idea from an expression and we wonder what laws, if any, will ultimately govern what we're doing.

We are caught, as you are, between a commitment to the free exchange of ideas, which is the flower of our civilization, and the business notion of secure property, which makes that civilization prosper. The law no longer provides the unambiguous guidance that information companies need to avoid injuring each other during the rapid expansion period ahead, and we fear that it may no longer even be capable of prescribing a fair remedy.

Consider how the industry derives and compiles new products and services from existing ones. An original report, well researched and perceptively written, often becomes itself an event to be reported. A Wall Street research report, for example, will create news. It will get quoted in the newspaper, picked up by a market newsletter, and circulated by clients who find the information valuable. While all this is meant to enhance the distribution of important ideas, it often ends up eliminating exclusivity which was the one advantage the research firm intended to provide its clients.

Meanwhile, an abstracting service writes a brief summary of the newspaper article and mails it to subscribers, even as an on-line financial wire service writes another abstract of the story and sends it out over the phone. Copies of the report go into private libraries from which they freely circulate and, inevitably, the full text of the original report makes its way into the hands of a competing research firm which then prepares a larger market study using these findings as the keystone.

None of these efforts quote very extensively from the original material. Prose style is not the essence of the value here. But all of them try mightily to capture the central ideas. In due time, a new publisher strips the market forecast numbers from the abstract

and includes them in a data collection which is then sold to major corporations and to other investment analysts. The wire service abstracts are added to an on-line data base which can be accessed more easily by future researchers. An enterprising subscriber to the data base signs on, starts up a search, and records it on his floppy disk—which we've learned to call "downloading"—and in time, he transfers the content of that disk to the company's central computer archive where others can retrieve it.

In this very real but much simplified description of the information industry, a number of laws are imperfectly at work. In theory, all of these products are copyrighted, but in practice, they borrow liberally from each other without once paying license or royalty fees. The analyst who wrote the original report gnaws glumly on the bones of notoriety vowing next time to say something really provocative, while his employer swears to restrict future distribution even more sharply.

The journals that quoted him are emboldened to be more specific and more comprehensive in their coverage of such reports and the abstractors who feed on the journals resolve themselves to take even bigger bits next time. In fact, there is no protection.

A few years ago, this subsidiary distribution took time; sometimes it took months, during which the original audience had an information advantage over those who were getting it secondhand. But today's technology allows us to abstract the New York Times, for example, and make it electronically available for browsing or for systematic searching by 8:00 a.m. the morning of publication. A market research study can be abstracted or summarized and stored in computer memory within hours, where anyone with a PC and a password can benefit from its advice.

The law says that derivative works require permission of the original author, but the definition of derivative is ambiguous in this context, leading us to believe that rigorous abstracts, like brief plot summaries, may not be among the author's exclusive rights. And that old standby, fair use, now seems to cover a number of forms of re-use, even those that might erode the market for future sales. A family that can take a movie off television is less likely to buy that tape in the future. If a subscriber to an on-line economic data base retrieves the U.S. economic model from 1972 to 1982 for all the industries in his SIC code and records that retrieval on his disk as he does it, is that fair use?

Even the copyright procedure for a data base seems difficult and inappropriate, since the copyright seeks to protect the data set, which is ephemeral, not the rules that fashion that set into a usable form, which are the real genius of the publisher's effort.

We look for protection under various unfair competition laws and in fact there is case law, International News Service versus Associated Press, to discourage the systematic misappropriation of hot news. And yet, radio stations rip and read the press with impunity and some on-line services use others as unidentified and unpaid sources. We've developed elaborate leases and contracts that try to prevent subscribers from reselling data base access, or building compilation products in any form, but since many of the individual items of information are freely available from other sources, it's often impossible to prove that the contract was broken.

We watch usage patterns and build software in the computer system to help identify the downloader, but as a matter of fact, it's very difficult to write a contract that prevents the user from buying *too much* without appearing to contradict our own advertising.

Above all, the issue is how to encourage a rapid evolution toward more effective information distribution and access systems, how to follow where the new technology beckons, without the business damage and litigation that ambiguous laws seem inevitably to reap. In the cases I've raised here, we're concerned not with the artistic creation of a work or even the costly invention of a new chip or a software package, but with the commercial process of using new technology to increase access to ideas. I'm beginning to suspect that the copyright law may not be the best legal tool for achieving the regulation we want, but that commercial laws like misappropriation or unfair competition may offer us a sounder and simpler foundation.

In France, in Germany, and in Japan, the governments are actively encouraging the development of new information access systems because they believe that these systems will improve health care and education, accelerate relevant scientific progress, and make industry more productive. We also believe that. But, in our case, we are not asking for interest-free loans, massive public investment, or a ministry for industrial growth. We're asking for laws that acknowledge a new technological reality that strikes a better balance between property and the public interest. We're asking for laws that we can understand.

What is derivative work? What is it about a data base that we're trying to protect? The data itself, or the recipe that forms it, maintains it, and presents it? What shall we agree are the customary first sale rights when it comes to information, and what's fair use in this context? There are other questions, more mundane, more procedural, but just as knotty. In fact, there are too many questions. They can be resolved in legislation, or they can be resolved in the courts, and we're resigned to a little of each. But we applaud the third alternative, which the Library of Congress and the Copyright Office has begun here this weekend, the possibility that we can craft some preventive guidelines that, with your help and counsel, we in the information business who are on all sides of this issue can get some lines painted on the track before the sound of crumpling fenders gets to be too much of a distraction.

Mr. WYATT. Thank you, Chris. Our next speaker is Ted McIrvine, Manager of Research and Development Planning at Xerox Corporation. Ted has had a 25-year career in the industry as an applied physicist, a research and development manager working for companies such as General Atomic at San Diego; Ford Motor Company in Dearborn, Michigan; member of the Governing Board of the American Institute of Physics. He earned a Ph.D. in theoretical physics at Cornell University in 1959.

Ted?

Mr. MCIRVINE. More than 15 years ago, at Xerox, the prospect of a future paperless office appeared to us as a potential threat to the photocopying industry. If there were no paper originals in the office, there would be no paper copies. We therefore established

business ventures and also began research in an extensive way into the computer and communications fields and, as a result, we have had now internally, beginning in the Palo Alto Research Center and spreading from there throughout research and into the administrative offices and corporate headquarters, we've had now 12 years of experience utilizing a large network-based set of personal computers. Obviously, we were using them when they were not economically viable, but where we were subsidizing it in order to learn from that experience.

Ethernet is now our commercially offered Local Area Network, shared as a standard with several other companies. The Xerox 8010 Star is a professional work station offering that arose out of that work. So the things I'm going to say really result from the research precursors of that activity. And from that experience and from our study, I'll offer two summary observations. The first is that the use of paper will increase and not decrease as a result of the new electronic technologies. The second observation is that the role of paper will change.

As Daniel Boorstin said yesterday, new technologies change the role of older technologies. They generally do not render them obsolete.

To be perfectly frank, many of us were surprised to discover the degree to which paper continues to dominate the desks of highly automated knowledge workers, but I believe we now understand why that is so and therefore have confidence that the phenomenon is not transitory.

Before mentioning those two points, I'd like to lay some groundwork regarding visual image quality in video display units and in paper. We heard yesterday in the teletext discussion the observation that the British standard with 4,800 picture elements was insufficient, and the NABTS standard with 50,000 pixels was pointed out as being superior. (A pixel is a picture element, or a resolvable and communicable element in a video display.) However, I think many of you who were in the display rooms noticed that the optical disk quality, for instance, of the Library of Congress system is considerably beyond that. In fact, it's on the order of a quarter million picture elements. And when I take a sheet of paper and hold it at a normal viewing distance, my visual acuity can resolve something like 10 million picture elements. So we have, from the past, conditioned ourselves in our society for much higher resolution than is generally accessible in video display units.

The history of the burgeoning electronics industry, however, has been toward broader bandwidth for communication, cheaper storage, and therefore, gradually relieving from what were originally (as you may recall from the days of tabcard equipment and early computers) all capital letters. We had block letters, no apostrophes, a lot of things missing from the font. We moved from there to upper and lower case letters, full fonts, and diacritical marks, and now we're moving beyond that into techniques that allow you to have italics, boldface, to change the type font from Helvetica to Times Roman, to put in logos and letterheads, halftone pictures, and to get at much, much more detail. It is allowed economically because of the reduction in cost of bandwidth for communication, and the reduction in cost of storage capacity. And it has resulted in

what we now call bit map displays, where every bit from a page is represented in the computer memory at some point.

So we're working and have worked within our office systems towards high resolution displays and something which we call, "What you see is what you get": what is on the screen is also what will appear on a sheet of paper.

We would have thought that the high-resolution displays therefore might have led to less paper among our knowledge workers, but instead they use more. The reason is that people will try several different formats. They'll change. Times Roman looks like a typewritten letter; Helvetica looks as though it's coming off a lithographic press. You may want to try using some 10 point, 12 point intermediate titles; so you play with these, and then print a hard copy of every one of them, take a look at it, and then decide what the document will look like. So there's a shift in the use of paper, but in fact the amount of paper is not reduced.

I'll speak briefly now about the characteristics of a VDU. I'm assuming that we have a good visual display on the video display unit in the sense that there will not be a problem with flicker. I'm also assuming a high resolution CRT; many, many bits. Nevertheless, the following problems occur. You have a battle between room illumination and reflection from the screen. If I'm going to look at the other sheets of paper that are on my desk, I need room illumination. But that light that is lighting my paper very nicely also reflects from the screen. I have a problem that I wear bifocals. With bifocals, neither lens is right for the viewing distance of the screen, so I have to keep what an optometrist calls "music glasses" at my side. I put down my bifocals, don my music glasses in order to see the screen.

Also, it is a psychophysical fact that it is difficult to focus on a self-luminous image in terms of depth perception compared to a reflected image. There are some problems with contrast ratios of 10 to 1, as opposed to 30 to 1 on paper. Also, as a baby, one learns hand/eye coordination so that if you're holding something in your hand, you can move your body freely and still retain the hand/eye coordination. If I have a rigid display, I have to position my body in order to focus my eyes on it.

So there are many aspects that mean the VDU is not quite so good. As a result, one tends to accept these limitations of a VDU only in order to gain the other advantages that come with the electronic data base. Generally this means, (1) if I want to make a limited access of something which is in a data base, (2) if I want to retrieve, and (3) for interactive creation of text in word processing. I'm willing to accept those limitations because it is easier to do these other processes. But the moment that I want bulk access to documentation or if I want to browse through material, I discover that what I want is in fact a paper output.

As a result of this, outside consultants such as Dataquest are predicting a very, very great increase in VDU usage from about 390 pages per year for each information worker in 1982 to more than 2,000 by 1987, to 8,000 by 1992. (That is, each knowledge worker: professional, clerical, secretarial, and managerial, will deal with 8,000 screens in the course of a year by 1992.) It sounds impressive; however, paper usage is now in the office at 22,000 pages per year

per information worker and is anticipated to stay approximately that, growing slightly over the next 10 years. So the predominant use in the office will still be paper.

I have said, however, that the role of paper will change, and let me just quickly mention some of the ways in which paper comes out in an office environment. Of the 1 trillion pieces of paper that are produced each year in American offices, 40 percent come from computer printers. About 3 percent now come from what we call "office printing," decentralized small printers or facsimile units. We expect that number will rise. The amount from computer printers will stay about fixed. At present, about 23 percent of the hard copy comes from press duplicators; primarily lithographic presses. That continues to slowly go down. Prints from xerographic copiers and duplicators is at about 22 percent and is slowly going up. Use of carbon paper is still there and NCR sets, form sets, about 10 percent, but slowly going down. Typewriters, which used to be the only way to generate the originals (other than handwritten), now produce 2 percent and will hold about steady.

In terms of offices, the goal of office automation is not to reduce paper, because the cost of paper in fact is very minor. The goal is to perform the activities of preparation more efficiently.

Martin Greenberger, last evening, called this the post-print era and I would respectfully disagree. It's not the post-print era, but the post-Gutenberg era. The printing will no longer be done on the traditional printing press. As that changes, you discover that for the average book it costs $229.00 a page for the editorial work and $43.00 a page for the composition work, which results in about one-third of the total cost. One percent is for the printing and binding, and 3 percent for the paper. Then 52 percent is applied to the distribution and retailing.

We see a potential of reducing editorial costs in books. In our studies of office use, the comparable preparation cost runs anywhere from about $70.00 a prepared page for a technical writer up to perhaps $300.00 if he's dealing with equations. There's where the potential savings can come by using the new technologies. As we do that, we will change the balance between the creation, the editing, and what used to be called composition as a separate function. Composition will get mixed with the creation. As Marshall McLuhan said some years ago, "In the age of Xerox, every man is a publisher."

In an era where every man is a publisher, the question of control of copyright, as Chris Burns has said, is a very different matter. You do not have centralized publishing activities but decentralized publishing activities. Not only do we have a problem, as my copanelists have pointed out, from the potential of copyright violation through a $2.00 floppy copying a $200.00 intellectual property of a program. Also we will continue to have the problems of a $10.00 print or photocopy job on a $30.00 intellectual property that is a book or an electronic representation of that book.

We believe that paper will continue to play a very very large role, but that role will change to one that interacts very definitely with electronic technologies.

Thank you.

Mr. WYATT. Thank you, Ted. Our fourth panelist is Don Devine. You've heard Don briefly yesterday. He's the CEO of Trilog Incorporated, a software data processing services company. In 1983, he was the first President of the new Microcomputer Software Association, a group that I understand went from zero to 180 members in something like a few milliseconds. [Laughter.]

This year, he is President of the Microcomputer Software Section of ADAPSO.

Don?

Mr. DEVINE. Good morning. When I think about how things are changing today, I often remember my grandfather. When I was a boy, I lived with my grandfather. He was born in 1870 on a farm in Elizabethtown, Pennsylvania. It a was prosperous farm. I got to know the old man very well. Like all grandfathers, he had the need to tell me how tough he had it when he was a kid, so I learned a lot about what it was like growing up there.

Of course, they didn't have central heat. They didn't have any telephones. They didn't have any electricity. Even though it was a prosperous farm, there was a pump in the side yard for water. They had to bring it in by the bucket. There was a small little building in the back with a half moon on the door. He was already a mature adult when the Wright Brothers flew at Kitty Hawk. He saw the beginnings of aviation, and when I think about my grandchildren, I think they're going to see it commonplace for people to take their vacations on the moon.

When my grandfather was six years old, Alexander Graham Bell created the first experimental telephone. He saw the beginnings of the communication revolution. My grandchildren are going to have access to a hand-held, portable, worldwide instantaneous communications device, be able to call up anywhere, any continent, any person, from wherever they are. They'll be able to transmit pictures, words, data, voice, graphs. It'll be a computer in its own right. They'll talk to it, and it will talk back to them. There is a lot of changes taking place. I'm in the middle of it; so are you.

Most of the changes we will be seeing in the next 50 years will depend on computers. We're going to see computers in spaceships and in planes and in trains and in boats and in toaster ovens. Already general purpose computers are in more than 7 percent of American households. We heard Dr. Greenberger last night say that there will soon be more personal computers in households than there are television receivers. The same thing is happening in businesses. There will soon be more personal computers in businesses than there are telephones; in fact, the telephones will become part of the personal computer.

These changes will depend upon hardware and software. Particularly in the general purpose computer area software makes the most important contribution. Software, together with the hardware, is the engine which will improve the productivity of workers in the coming decades in America. This is one of the most important things we need to pay attention to. Because growth in productivitiy is the means of creating growth of our gross national prod uct.

Software is somewhat different than most other intellectual property in that it is not aimed at human beings. Whereas music

books, magazines and film are aimed at consumption by a human being who wants to be entertained or informed, computer software is aimed at making a computer more effective in performing work. It's not aimed at a human being.

It's been suggested by some people that the copyright law may not be the way to protect computer software because it is aimed at being read by a machine. I don't know the answer to that, but it's an interesting question.

What we need to do now in order to accomplish these advances in productivity is to create an environment which encourages and rewards people to be creative in developing computer software.

Creativity responds to market demand. In the late 40s, in the 50s, and in the 60s we saw a worldwide phenomenon where some of the greatest intellects in the world left their native countries and changed nationalities. And they came to America. They came to America because they had the opportunity to be creative here and to get the rewards of creativity which are both economic and non-economic. Both economic and non-economic rewards are important. Some of the leading countries in Europe were so concerned about this migration that their governments spent a lot of time working on how to solve the "brain drain".

We need to make sure that we have an environment which encourages creative people to build software, because software is the engine for improving national productivity. In order to do this, we need adequate protection.

I wish I was able to tell you how to do this, but I'm afraid I can't. The problem perplexes me. I understand the question, but I don't understand the answer. The only answers I've heard suggested so far are answers that a mathematician would call necessary in that they would contribute to a solution, but insufficient in that they do not force a complete solution.

The real costs associated with software are the development of the product and the development of the marketplace, as Dr. Greenberger said. The cost of duplicating the software is insignificant. We had a demonstration yesterday of how readily available commercial software will break the copy protection schemes used widely today to protect software.

We may get an effective technical solution eventually, but we're not likely to get it soon, in my opinion. I think it might be more than a decade before we get an effective technical solution. That is the decade in which we're going to see a great proliferation of personal computers throughout homes and businesses. That's the decade in which we have to be most careful about establishing behavior and expectations. We must not let it become acceptable behavior to pirate software. Otherwise, we'll never stop it a decade from now.

There are three types of software pirates, as Dr. Greenberger talked about them last night. I would like to mention them again now, but simplify them a bit. But before I do, I'm always intrigued with words. Why do we call these people pirates? You know, some people in America have a romantic image of pirates. They remember the motion pictures of the 40s and the 50s where the pirates were the good guys. I don't like calling these people software pi-

rates. They're really a lot more like burglars. As I said, they fall into three categories. My categories agree with Dr. Greenberger's.

The first category is in the home, people are making copies and giving them to their friends and their relatives. This is a carry-over of the way they use photocopying machines with written copyrighted works. The *Betamax* decision may encourage this behavior. We should be concerned about it. Concerned about it because it creates an image of acceptable behavior in the community and once that's established, it is very difficult to change.

The second group is in business. It may be an act of management omission; that is, the absence of a policy against burglarizing software, or an act of commission, where they say, "Look, let's buy one copy. We have 150 people who need it; we'll make 150 copies." As a result of commission or omission, businesses are illegally and improperly copying software and using it with their own enterprise to help them run their own business. We should be even more concerned about this violation than we are with the first category.

The third category is where a company essentially is counterfeiting the software, repackaging it in some way, and reselling it. Enforcement is the principal problem in this third category. The first two categories are much more complicated to resolve.

We should treat each of these three categories individually; that is, somewhat differently. The personal computer software industry is a new one. It is coming to grips with what it should do. It's a young industry, it's learning, and it's maturing. For example, last year the industry encountered software rental for the first time, and didn't know what to do about it. The industry still doesn't know what to do about it, but the first sale doctrine is of concern to us, obviously. We're reacting in other ways. Dr. Greenberger said last night, some companies have 150 potential users in a single department and these potential users don't want to pay 150 times the retail price for a piece of software: In response to this the software industry is beginning to develop volume discounts and site licenses. There's evolution taking place.

However, we have tried every one of the technical approaches to software protection mentioned last night by Greenberger, and none of them worked satisfactorily. We don't have an effective technical approach. They can all be overcome. They're all inconvenient, where the customers don't want them or for some reason that they don't work well enough.

I've made a couple of points today. Perhaps the most important point is that education is a key. It's necessary, but I don't think sufficient for us to educate people that software piracy—software burglary—is in fact inappropriate behavior.

I've indicated that personal computers are proliferating. It is incredible the rate at which they're proliferating.

I've pointed out that software for these personal computers is the engine to increasing America's productivity in the coming decades. Through our actions as a nation, not just as a Congress, but as a nation, all of the people, the industries, the schools and universities, we need to create and maintain an environment which encourages and rewards the creativity of people in making new computer programs. This is our best route to increasing national productivity.

QUESTIONS FROM THE AUDIENCE

Mr. WYATT. And the balance of our time, ten to fifteen minutes, for questions from the audience. Yes? Hello, Martin, how are you?

Mr. GREENBERGER. I'd like to respond to Ted. I appreciate your offer to replace post-print with post-Gutenberg, but I've been sitting here thinking about that. I think I prefer to stay with post-print, for two reasons. First of all, if by post-Gutenberg, you mean post-hot metal, we're already there. So it really doesn't characterize what's really going to be different about the way we do business in the future as opposed to the past. By post-print, I think I make clear—at least, I tried to last night—I wasn't talking about the elimination of print, and certainly not paper; I agree with you 100 percent. It's increasing in volume, and that will continue. And certainly not the market for xerography. But simply the dominance of print in the way we get our information and perform our activities and, of course, most relevant to our subject at this meeting, the dominance of print in the thinking about the need for protection and how the best way to implement it and enforce it will be.

The point I was trying to make with that phrase is simply that we're going to have new criteria that will be replacing the copyright law that has been rooted in print in past years.

But I appreciate the point you were making, also.

Mr. MCIRVINE. I think we're very close. There is always a pace of change, of course, and I was intrigued about two weeks ago to receive an electronic mail message which very proudly was being sent by someone in Britain to every electronic mail service he could find. Martin probably also got a copy of it. There were 62,700 recipients of this message. The following day, I was in a meeting with the head of the Gannett Electronic Task Force, who happens also to be the publisher of the Sioux Falls, South Dakota, Argus Leader, a newspaper which has a Sunday circulation of 65,000. It's going to be a long time until we can reach such broad distribution. The newspaper business, while it will change, is not really in danger of evaporating overnight. The only growth area in the magazine publishing last year was in computer magazines.

It turns out that electronic media, in fact, is increasing the amount of print-based activity that goes on, and I think that there will be a continuing role because of the economy of mass distribution for the paper medium.

Mr. WYATT. Yes?

Mr. BERMAN. Jerry Berman, from the American Civil Liberties Union. This question. For the last day and a half, I've heard a lot of talk about piracy and the need for new protection in order to—so that there will be an incentive for people to create software. I have heard no statistics, no evidence, no case studies of anyone stopping producing software because of piracy. In other words, it it—who, where is the damage to the incentive structure. Who's going out of business? Who's losing money? Who's not being rewarded enough to show—to keep the arts, sciences, progressing in the area of the new technology?

PANELIST. There's two things that are happening. There are some companies that are suffering economic loss from software piracy of existing products. There are no really big companies yet in the soft-

ware production business. And we have seen some companies, like—I'll use Micro-Pro as an example. It's a company which decided not to put a copy protection algorithm on its disks and they have had—they're suffered some problems. Some of it might have been management problems and some of it might be because they are losing markets. It's hard to tell. When a company starts having trouble, what really is the trouble? Is it in trouble because it didn't manage itself well, or is the trouble because it's suffering from software piracy?

And let me give you the second aspect of it, which is different than the way you directed your question. The cost today of building a new piece of vertical market application software that might have run on a mainframe but could run on a personal computer is probably on the order of $2 million. Roughly. And there are a lot of people out there today who are saying, "I understand this. I could do it." Whether they're companies or entrepreneurs. And now they're asking themselves the question, "Where am I going to get the money to do this?" And, granted, that most of the venture capital money in America today may be in computers and software, they're still finding, when they go to their bank or when they sit and think about it themselves, there's only 30,000 prospective people out there, they're relatively small businesses. Dare I build it? Will it get away from me? How will I ever get my $2 million back?

And I'm sure there are some decisions that are being made today which are causing people to hold back.

RESPONSE FROM AUDIENCE. (Inaudible.) I think the answer can't be that elusive. Because you're talking about extending monopoly protection or of giving new kinds of licensing protection for software, and you're saying maybe there is some disincentive in the market. I think you really do have to say that someone wants to develop software and he can't get a bank loan because he can't get a return on that investment because everyone knows it's going to be pirated and he'll never recoup the $2 million.

PANELIST. I don't have a specific example for you, but I can probably get one.

RESPONSE FROM AUDIENCE. Well, I think Congress is going to need some.

PANELIST. That's fine. Someday, I'll volunteer to testify before Congress with a concrete example, but I don't have one of those right here with me today. Nonetheless, it is a serious situation. Let me just give you two statistics which are questionable, which is why I didn't have them in there before, because we can't seem to do definitive research to prove these statistics. Very elusive. When you ask people if they're breaking the law, you don't get good responses to your surveys. [Laughter.]

But Visicorp has done some serious studies and they believe that there are two illegal copies of their products for each copy that they've sold. And some of the game software people, entertainment software people, believe that there are 30 illegal copies for every copy they've sold.

Now, in the Visicorp situation, that might actually represent lost revenue. In the game situation, it does not because if they had to

pay the full price of the game, those 30 copies would not have been purchased.

Mr. WYATT. Chris, you had a comment on this. It's a very provocative question. It's a fundamental question, I think, to this discussion.

Mr. BURNS. And it's made more troublesome because if you search the past for anything like this to give us a model, you end up facing the library and books. And we've been selling books to libraries for hundreds of years and libraries circulate that, and we've never referred to it as piracy. We've never sold books to a library at a price higher than we'd sell it to individuals. It's an accident of history that we began with libraries, because printing a book was so expensive and so difficult to do. And now, in the software business, we seem to be going at it in the other direction, and saying, "No, we don't want libraries in this case."

Mr. WYATT. Just a personal reaction to that question; that is, after having spent the last 8 years or so in the venture capital area, and participating in, say, fifty venture capital investments, about half of which were software, I did not see any effect from the venture capitalists of fear about the current situation; that is, trade secret protection seemed to be the way people were relying on protecting their software. But I saw no investment that was not made because of concern for piracy. That may not be conclusive.

RESPONSE FROM AUDIENCE. Perhaps just one other side of it. The Visicalc demonstration yesterday, where he was showing how it's easy to pirate that software. And what he said is that what we keep doing is upgrade that ———, and that keeps our market going. So, in one sense, he was ironically saying that pirating was leading to more progress and more development and more investment (inaudible).

RESPONSE FROM AUDIENCE. I think what he was saying is that he's upgrading his copy protection technique, continually, in order to circumvent——

PANELIST. I thought it was both.

PANELIST. Yeah, I know he was doing both. The one he does most frequently—he doesn't release a new version of Visicalc anywhere near as often as he releases a new version of his copy protection algorithm. [Laughter.]

Mr. WYATT. If I could just have one quick comment. I've hesitated a bit here because it's—what I'm about to say is speaking on behalf of large companies, and generally, people are looking for the rights of small companies and new starts, which may not be so much at a threat by the lack of copyright, but from a large company point of view, as I say we have put fifteen years of research and we've come out with certain protocols. We have a potential problem between the balance of implementing new protocols; for instance, something called Interpress, which is a format for communication between the creation of documents and between printers. If we publish that, then, without spending on the R&D, anyone can come in with a printer and attempt to compete against us. If we don't publish it, it makes it much less useful.

So we have a business problem, resulting from some $50 million worth of investment.

RESPONSE FROM AUDIENCE. Yeah, I wanted to comment also on the software protection issue since I happen to handle personal computer software for a parent company. I tend to agree with Mr. Devine's statement that there isn't a hardware solution on this solution to the problem. Because one of the problems that we've encountered is that the utility of the program for the user may be seriously damaged by the attempts at protection. We have a very stringent policy of purchasing a copy for each user, so that isn't an issue.

However, one recent problem we've had is with a program that is so heavily encrytped, you might say, in the manner that it's recorded on the disk, that the manufacturer is not solving operational problems, because it's so laden with cross-checks and check sums and everything else that there are no simple solutions to correct minor problems. It must wait for the next revision.

The other thing we find is that it's protecting us from getting it on to our company hard disks, even though they're legitimately paid copies of the program.

MODERATOR. Do you have a question? Yes?

Mr. HOFFMAN. Alex Hoffman, with Doubleday. I'd like to just supplement something Don Devine said in terms of the importance of education and the importance of, if it is at all possible, preventing the building of a public attitude. If you look back on the experience of book publishers and periodical publishers and journal publishers, with a photocopying machine, I think one of the biggest sources of the difficulties we have now, both with the enforcement of the present law in the field of print, is that the law didn't get changed quickly enough. The question of systematic photocopying went unaddressed by the law for a long time. And by the time it finally did address it, the public, understandably, had come to take the use of the photocopy machine as a birthright. If the machine is there, you use it. And by the time the law finally came around, saying: "Well, there really must be some reasonable limits on this," people took that as an unwarranted intrusion on their right to copy whatever they wanted.

And it looks to me, from what I saw yesterday, that the problems of the software people have are, if that's possible, much worse than the problems that we've ever had. And so, if it comes to be the public attitude that it's there to be taken, that there's no reason not to, as he said, if that becomes ingrained the way the use of the photocopy machine has become ingrained, the solution is infinitely more difficult.

MODERATOR. Yes?

Mr. YOUNG. I wonder if Mr. Devine could give us his slant on the effectiveness of some of the safeguards against burglary that haven't yet been discussed here this morning? They were mentioned last night, but——

Mr. DEVINE. You're talking about some of the technical approaches?

Mr. YOUNG. Yes. The code words, or——

Mr. DEVINE. They fall into two categories. One of them is user customer dissatisfaction, and that is one of the largest categories. And we heard it mentioned here a minute ago. Once you begin putting encryption techniques into your software, and once you begin

putting other hardware-related requirements in, it makes the software less user friendly and less effective, in fact, in doing its job. And the customer rebels against that. He says, "I don't want to have to always have a communications mode I'm on and always have to log into the master computer that's 5 to 2,000 miles away every time I want to run this program in order to make sure that you count the number of times I've used it." That was one of the techniques that was mentioned.

Another one is putting serial numbers into the machines. One of the problems we're faced with here is that it may in fact be appropriate to be selling software for a single simultaneous use, but not only on a given machine. It may be that you will have the same machine at your home and at your office and you want to buy one copy of the software and this might be reasonable, depending upon the software publisher's attitude, to sell you one copy and wherever you are, you can go to your machine, whether it's at home or at work, and use it. But if that piece of software could only be used at home or only be used at work because of the serial number on the machine, you're going to be very annoyed.

And then there's the high cost of embedding the serial number into the code.

One of the things that was mentioned is that we can also uniquely identify each copy of the software so that if we find a pirated copy, we can trace back through record keeping or distribution channels where it came from. That is largely being done, but it is largely ineffective because your distribution channels, when you go through hardware manufacturers into wholesale distributors into resale people and then the guy who sells his computer with the software on it to someone else. And then, finally, it gets pirated. So that one's a hard one.

Another item that was mentioned was adding devices, whether it be a plug-in to the joystick panels of your computer, or whether it fits into a slot in the back of your computer, which you have to take that out and carry the software to another computer if you want to use that software somewhere else. In other words, this is a transportable device which plugs in externally to this piece of hardware, which enables the computer to use it.

A few people have used that, but the problem is that the standardization, the variations that are involved in this, are so complex that we haven't believed that it was practical for us to somehow be able—if you had fifteen pieces of software, we wouldn't want you to have to have fifteen of these hardware devices; one for each piece of hardware.

It comes back to the serial number of the machine problem.

I know I've rambled a bit. I hope I've answered it.

PANELIST. In one of the videogame cases, the plaintiff had a marvelous case because it turned out that in the program, when you reconstructed a chip, there was something buried which would not have surfaced in ordinary use of the chip, but when you reconstructed the chip there was the identification of the manufacturer.

PANELIST. Well, that technique's been used. There's also been a technique used that says after you've run the program fifty times, it self-destructs. And if you don't have it—and we know that when you register it, we send you a new version every so often. You

know, those kinds of techniques are not looked upon with favor by the consumer.

PANELIST. One way I've suggested, if you touch the screen, it recognizes fingerprints. [Laughter.]

Mr. FISH. Hamilton Fish, Jr., House Judiciary Committee. Pursuing this issue of alternative protection under the law, I guess I'm concerned about the difficulties of enforcement. And one of the things we try to avoid doing in Congress is to create laws that cannot be enforced; laws which, hence, would only bring disrespect to the law. And Mr. Devine has told us the technical means won't work, and Mr. Burns indicated that commercial law may better protect intellectual property than the copyright law, but that too would involve bringing to enforcement the problems and difficulties there.

So I just wonder that the panel thinks of the possibility of rewards for the creator other than money.

PANELIST. I don't have a pat answer for that. I wish I did. But some of the things that we think are answers in the right direction.

We think education is important. That's not necessarily enacting legislation to create penalties or rules at this point, but education is something the people in the industry are doing and I think that throughout our country we should be involved in.

The second area is that we can expect that the people who own the property rights will be willing to take steps to protect their own property rights under civil law if they have adequate protection, adequate reward for doing so.

Let's take Visicorp, for example. If they have two pirated copies for each legitimate sale, and a legitimate sale's worth $290.00, let's say, and they go and they find someone who has pirated two copies of it, and as a result of all of their research and investigation, they get $500.00 of lost revenue, it was not in fact very economical for them to do that.

It may be that we can somehow structure things to make it more economic for them under civil law to get recompensed—maybe it's treble damages, I don't know. I don't have a proposal for you today is what I'm saying, but, you know, the concept is that we need to help them to be able to, in the free market, to do under the law what they should be doing, protecting their rights.

That's the best suggestion that I have.

Mr. WYATT. Other comments on that question?

PANELIST. Well, I don't have a specific comment on that proposal, I do know that in the history of intellectual property and Congress, occasionally the concept of the reward rather than an instrument of property rights has been toyed with. But beyond that, I don't know much.

But it does illustrate, I think, the point that it may be where we need to sit back and develop from a tabula rasa our objectives. What it is we want the instruments of intellectual property to accomplish. What kinds of rights, what kinds of incentives we want them to enforce. And reexamine the basic question of what kinds of instruments should be developed to do that. And that may be the only approach to drafting the wiser legislation that Congressman Kastenmeier referred to yesterday.

RESPONSE FROM AUDIENCE. I have a comment and a question. The comment is directed at Mr. Burns's remarks. You had some of the solutions to some of the problems, and I'm talking particularly about data bases right now. They're not to be found within copyright. From the very beginning, copyright has tried to protect the works of high creativity, like, say, a great painting, or an opera or a novel, on one hand; and informational works on the other.

Data bases are of a peculiar nature. As a matter of fact, they are changing so constantly; in many cases, continuously, that they are never really fixed. So it may be that we may have to indeed look outside copyright, which I think Mr. Burns referred to as commercial law. But what has been referred to is the law of misappropriation. Now, that's an amorphous doctrine. The Van Dykes didn't like it, Learned Hand didn't like it. All I'm saying is it may be that in data bases, for example, we cannot force solutions.

And, by the way, this is assuming that we decide as a matter of policy that we want to accord some kind of protection. Assuming that, the solution may not always lie in copyright.

Now I come to my question. In the case of downloading either programs or data bases or parts of data bases, the problem is common with other kinds of copying going on now by consumers in their own homes, which is to say out of sight. Assuming that some kind of protection would be given against downloading for personal use, is there any way—a systematic way of detecting how that occurs? So that it could be policed if liability were indeed imposed.

Mr. WYATT. Chris?

Mr. BURNS. Yes, there are ways of detecting downloaders. By comparing their usage to the normal use of the data base. And when you see somebody whose search encompasses the entire data base from a certain point in time to another point in time, you can conclude, and if he does this systematically, you can conclude—you then go interview the person and say, "What are you doing?" [Laughter.]

And data base publishers have excellent records on who uses the data base and with what frequency. Now, having said that, I'm not at all sure that we should try to protect data bases in this fashion. The technology will change the way we distribute data bases in the next five or six years by giving us—I envision the following procedure. That in five or six years, the data base publisher will sell the user an optical disk that contains the data base as of last year, and then he will sell him a second floppy which is the last eleven months, and then he will provide him a service that updates the data base. And by doing that, he will have avoided entirely the issue of downloading a substantial portion of the data base and we will begin to recognize that the service we're performing here is not encompilation, but an awareness service.

Second, I'm troubled by the idea of protecting data bases because in fact most data base publishers got that material free. This is not an act of artistic creation. The very best data bases in the country: Lexis, DRI, and others, are built on publicly available information. And what they've done is to build software systems that are clever and user friendly that allow people access to information that was available to them anyway.

PANELIST. Well, let me respond to that. I don't want to take too much time on it. Copyright has, for a long time, protected works of diligence and industry as opposed to high creativity. Copyright, for example, has protected telephone directories for a long, long time. So that's really not a distinction. It does underline the point that the solution, assuming that you want to protect data bases, may not necessarily lie in the area of copyright where it's lodged right now.

Mr. WYATT. Thank you. I am told that we are out of time. In fact, we are past our time. We're running on a very tight schedule this morning.

I thank you so much for your attention. I appreciate very much the efforts of the panel.

[Applause.]

Mr. LEIBOWITZ. Let me again thank the panel and Joe Wyatt for moderating the very interesting and provocative discussion that we just had.

Because of the time limitation, we can't always have the opportunity to get to all of the questions that we all have. However, we would hope that during the reception and dinner tonight there will be more opportunities to discuss many of these issues in a lengthier period.

After yesterday, I get a little worried because of the time constraints when I hear the word download. So, hopefully, nobody will use that word any more. [Laughter.]

Before we go on to the next panel, I would just like to note some of the distinguished members of the audience that we have today. In addition to Senator Charles McC. Mathias, who is Chairman of the Senate Judiciary Subcommittee on Patents, Copyrights and Trademarks; and Senator Jeff Bingaman from New Mexico, we have many members of the House of Representatives concerned with copyright issues. And I would like, at this time, to have the Chairman of the House Judiciary Subcommittee on Courts, Civil Liberties, and the Administration of Justice, Representative Robert W. Kastenmeier, introduce his colleagues to us.

Mr. KASTENMEIER. First, I'd like to introduce the ranking minority member of the House Judiciary Committee, Hamilton Fish, Jr., of New York, who asked a question earlier. And between us is John Conyers, Jr., Chairman of the Subcommittee on Criminal Justice, Judiciary Committee; he served on the Subcommittee dealing with copyright revision during the mid-1970s, John Conyers, Jr., of Michigan.

And next to me, also from Michigan, who served the last four years on the House Judiciary Committee, is Harold Sawyer. And, at the end of the line down there, the ranking minority member of our Subcommittee and a senior member of the Judiciary Committee, a member, incidentally, who serves on the Commerce Committee as well, Carlos Moorhead, of California.

Also, in the front row is Rick Boucher, who represents the State of Virginia; from the State of Florida is Larry Smith. These are our six Members; I am pleased that the seven of us could be here this morning.

And I'd like, if I may intrude on your time, to suggest that we do need to know who will in fact be going on the plane. There will be

a group going first to IBM. We'll need to know which of those persons will be on that plane; those persons who are not going to the IBM facility and are going on the plane will be picked up here.

MODERATOR. Thank you, Mr. Kastenmeier.

PUBLISHING, LIBRARIES, AND EDUCATION

Mr. GOLDSTEIN. Yesterday, during the demonstrations, we saw various applications of computer and video disk and other technologies in terms of publishing, their educational use, as well as library use in access. The panel we have now will deal specifically with those issues.

Our moderator for the panel is Dr. Toni Carbo Bearman, who is the Executive Director of the National Commission on Libraries and Information Science. After earning her degree—her doctorate degree in the management of information resources, from Drexel University, Dr. Bearman worked in London as a special consultant for the Institution of Electrical Engineers. Dr. Bearman also has worked as the Executive Director of NFAIS, the National Federation of Abstracting and Information Services. She is a member of the American Society for Information Science and a recipient of their coveted Watson Davis Award for 1983.

Dr. Bearman?

Dr. BEARMAN. Thank you very much. It's a pleasure to be here with you all this morning. We are running behind schedule and I want our panelists to have the maximum time permitted this morning. I also want to make sure that you all have an opportunity to ask questions. There's one comment I would like to make which I think might encourage some people in the audience. I happen to have living in my home my 5-year-old daughter and my 75-year-old mother, as well as, of course, my husband. And my daughter came home from school last week and said, "Guess what, Mommy? Now we're using computers in school." She's in first grade in the D.C. public schools. She then proceeded to tell us how it compares to our Osborn at home and the Centrex Mommy has in her office. She's now about to help my mother, who's a little hesitant to use it. My mother collects angels and Amanda is going to help her catalog her angels on a micro. So there is hope, I think, for the next generation coming along.

We have a very distinguished panel this morning, and it is a real pleasure for me to have the opportunity to work with them this morning. What wasn't mentioned in my introduction is that I've been working in this field for 22 years now. I feel like a bit of an antique, but what's even scarier is thinking about working in it for 25 more, when I think of what has already changed.

Well, our first speaker this morning is Stephen Breyer. He is presently a Judge of the U.S. Court of Appeals for the First Circuit. Before that, he was a professor of law for fourteen years at the Harvard Law School. He also served as Chief Counsel of the Senate Committee on the Judiciary. He has written, taught extensively in the field of economic regulation, and he has practiced it too, in staffing the Senator Kennedy Study of Airline Deregulation. He claims that he was originally given tenure at Harvard on the

strength of a single article he wrote about copyright. It's a very impressive article, entitled "The Uneasy Case for Copyright."

What we are going to do this morning, first, is hear from Mr. Breyer, who is going to present, I assume, the uneasy case for copyright in ten minutes. We are then going to hear from each of our other four panelists. The other four panelists I have asked to devote their first roughly five minutes talking to you about the applications of the technology in their area. Their second five minutes will be devoted to the implications of these technologies and issues.

We will then devote the remainder of the time to questions and discussion focusing on the issues.

Thank you.

Dr. BREYER. Thank you for mentioning the article, which I looked at in preparing for this discussion. You have a schizophrenic reaction reading an article that you wrote a long time ago. You read it and you say to yourself, "Hmm, very good, very good—darn right." [Laughter.]

And then there is an opposite reaction. As Bob Bork once pointed out, "There are many people who have written articles and books that were totally laughed at ('Prophets, Hah'). Nobody paid any attention to what they said. Then, later on, history showed that they were rightly ignored." [Laughter.]

You didn't come from Washington, the entertainment capital of the world, to hear my jokes. I have ten minutes and I'm going to make five brief points. I'm going to make these five points in a slightly controversial way. The issues are really shaded and there are arguments on both sides, but I'm going to try to be a little controversial. And the truth is, I do believe these points, but for complicated reasons, more complicated than what will appear.

My first point is that there are basically two views of copyright: what I call the "moral view" and what I call the "economic view." By and large, the courts and the law, over the course of the last fifty years, have come down quite squarely in favor of the "economic view." Now, what do I mean by the "moral view?" It's well summarized by the legendary King Diarmed, who said, "To every cow its calf." And he said figure out what it means later. [Laughter.]

The second view, is that of Macaulay. Lord Macaulay, in speaking to Parliament, said that copyright is basically "a tax on readers for the purpose of giving a bounty to authors." Now, if I could recommend that you read one thing in the history of copyright, (although I'd love to recommend my articles) I would recommend Macaulay's speech in the British Parliament. Even though it was about books, and it was given over a hundred years ago, it is topical and correct. I strongly urge you to read that one well-written speech.

What is the difference between these two views? Shall we reward the author in an amount equal to the benefit that everybody else receives from his work? That's the "moral view." Or shall we reward him with no more than the least he'll take to produce the work? That's the "economic view." Let me give you an example: The Bible. Should we charge people what the Bible is worth to them? Or would we charge them what it would take to persuade its author to produce it? I'm using that example, because I want you

to see the vast difference that there can be between those two amounts.

By and large, the courts have opted for the "economic view." I think you'll find that is consistent with broad tendencies of the law in antitrust, in economic regulation, in many areas where the law seems to fight against giving people more than it would take them to produce the product. Now, that approach is controversial. The Betamax case provides an interesting example of the philosophical debate. What did the five Justices of the Supreme Court's majority adopt? What did they quote over and over? They said that copyright law, like patent law, makes reward to the owner a secondary consideration. The primary object in conferring a copyright monopoly upon authors lies in the general benefits derived by the public from the labors of those authors.

Again and again, the majority used this type of language. The minority argued: "But don't you see, if we allow copying, the authors or the producers will receive less money?" The answer to that was: "So what?" "Lower revenue" is the beginning of the argument, not its end. There are people all over the world who are paid less than what their labor is worth. I mean, my goodness, do I have to tell Congressmen that? [Laughter.]

Do I have to tell that to judges? Think of the teacher, the man who clears a swamp, the person who invented the supermarket. Those people are not paid what their ideas were worth. What they're paid, and what they should be paid, is what it takes to get them to produce those ideas—to do the job.

That's the "economic view" and that's the view which, given the five to four majority in the Supreme Court, I think is predominant in the law today. Of course, it's up to you to say what will be the law of tomorrow.

My second point is that to apply the "economic view" requires balancing. Balancing what? Well, on the one hand, there are the evils of restricting copying; that is, the evils of requiring permissions, going through a lot of redtape to get permission to copy. It's of enormous social benefit to allow people to copy. I know this because I'm a teacher. Everything I say, I want copied. It should be copied, if anybody'll copy it. The problem is, they won't. [Laughter.]

And maybe there's even some social benefit—in fact there are enormous social benefits obtained by copying, by spreading information around, as far as possible. On the one hand you have to consider those copy benefits. What do you weigh on the other hand? I've looked at this excellent study by the Library of Congress. I don't know about its conclusions, but otherwise I think, this is a good document, a highly intelligent document which analyzes some of these problems in this area. What it says is that on the other side is minimal encroachment upon the rights of authors and copyrighters. At that point, I disagree. It is completely wrong in using the word "right." To use that word is to assume the conclusion. The question is what the content of that "right" should be. And in doing so, one must balance the value likely obtained from copying against what is on the other side. What is on the other side is the need for a restriction to bring about production. So my second point is: that need is what is in balance. We balance the harms involved in restricting, from the point of view of spreading

information around, versus the need for the restriction to get the work out there in the first place. That is my second point.

Now I'll become more controversial. [Laughter.]

My third proposition: lo and behold, the balance varies from area to area. Trade books are not like textbooks, textbooks are not like computer programs. The markets are different in all of these areas; therefore, the degree of restriction that is likely to be necessary is different in all of these areas. You can't just assume analogies between them. Think of Walt Whitman sitting in the garret. You get one answer. Think of the university wanting to spread information. You get a different answer. Think of Kodak, able to produce cameras, film, without any protection. (Kodak has never obtained patent or copyright protection.) You come to a third answer.

If you work by analogy, you'd better be certain that you have the right analogy, based upon the particular economic conditions of the particular marketplace at issue. And my third point implies strongly that in some marketplaces at sometimes the correct answer will be no protection.

Take the area, for example, of scholarly libraries. The case for protection there is very weak. Why? Well, scholarly material will likely be produced without any protection. There is a good argument that it will be. The people who produce it, by and large, are on somebody else's payroll. I wrote my copyright article for tenure; I didn't write it to sell it. (Nobody'd buy it anyway). The point is that the need to protect that type of production is fairly minimal. Have I forgotten the problem of the cost of publishing it? No. The question is how to get the money to the publisher, and copyright's one way of doing that. But there are other ways. After all, scholarly journals are produced by scholars, and published primarily for the libraries. If the libraries can't copy it, the argument is that the journals don't get as much money? The answer to that is that they'll raise the price of a subscription. They'll raise the price, if necessary, and they'll be able to because the libraries want it.

What about the libraries? Is it the case that what we gain on the swings we lose on the round-abouts? Not necessarily. Because at least, even if the sums of revenue involved come to roughly the same amount, we evade and avoid all the enormous complexity of getting permissions, if we collect the revenue via higher subscription fees instead of via a copying fee imposed pursuant to copyright liability. So maybe you would lose something without copying, but you perhaps have produced a simpler system.

I won't go into the details here. I just ask you to focus on this point before immediately jumping to the conclusion that we have to have a copyright system to encourage production, to deliver the money to the producer. We need to think imaginatively about alternative methods of doing that. That's my third point. Sometimes the answer could be zero protection or near zero, though not always, and not even often.

My fourth point is about new technology. Of course, we've all heard how we have to do something about new technology, about all the new kinds of copying that can go on. Now, I don't necessarily disagree with that. But I also want to focus on the contrary point, which is that at the very same time new technology makes

copyright restrictions even more harmful than ever. That may even be the primary function of new technology.

Let me give you an example. In Pennsylvania in 1910, there was a lot of stuff sitting around that was black and sticky and it was called oil. Now, suppose somebody had a monopoly on that. Well, people would have said, "What a pity. Too bad. But really, who wants it?" [Laughter.]

Now, bring into play the invention of the automobile and think about that same person who has the monopoly on that black, sticky stuff. You see, to gain all the monopoly profit from the telephone business, it's not necessary to own all the telephones. All you have to own is some little tiny bit of something necessary in a telephone and, suddenly, all the profit from the new invention can be yours. Then a copyright on an essential part of a new invention may give its owner all the profit from the invention. To the extent that there is a potential restriction, the new technology with enormous benefits creates a special risk of enormous potential harm through legal restrictions.

At least we must examine the potential for such harm before we decide, "Aha, the best route is protection."

Is the analogy to monopolies a fair one? One might say, "Well, we're not talking about a monopoly held by John D. Rockefeller. We're talking about tiny monopolies of small items. And that isn't even hardly a monopoly." But there tends to be a tendency to think that "the practical way of copyright owners collecting money is for everybody to get together and fix their copyright royalty prices"; then, suddenly, when we start talking about blanket licensing, and clearinghouses, and so forth, we've suddenly moved over from just a tiny monopoly, toward rather grander cartels or monopolies. Here the analogy becomes a little more apt.

My final point: New technology brings new problems of copying. It also brings new problems. We should beware of too much restriction.

The reaction, in Congress, when faced with a practical problem, at least the reactions of legislative assistants, tend to be: "That's very complicated. Let somebody else do it. We'll create an agency. And in the agency, they'll figure it out."

Given this reaction, I subscribe to the following warning. What we are really talking here is about dividing up money. The human beings who can think of how to divide up money—and that's what they'll be doing once the agency's created—don't have some special gift of knowing how to do it. They tend to negotiate and split the difference to arrive at some kind of a "fair" but random method. What are their tendencies? One tendency is to say "we'll get around the problem. Since it's very expensive to collect all these little permissions, we'll simplify collection clearinghouses and blanket licensing." Then somebody says, "My God, you've created a big price fixing cartel with monopoly potential." The answer: "Don't worry, we'll regulate it. We'll set up a commission . . ." But I remember that the FTC once said, "Let's try and label house plants in case somebody eats them." That is, commissions don't always do sensible things. And here we are giving them a job that is virtually impossible to accomplish, deciding a correct allocation of money.

And then we say, "Okay, don't worry about that. The Courts will be there to watch them."

Well, that's really the warning note. The courts will be there to watch them? [Laughter].

I remember what Oscar Wilde said when he read Dickens's Old Curiosity Shop. He read Dickens's account of the death of Little Nell and said, "one would have to have a heart of stone to read it without laughing." [Laughing.]

We tell the courts: "Well, you supervise how the Copyright Royalty Tribunal divides the money and see that it's right." What are the courts supposed to do? They know how to divide the money? We can't avoid the problem by saying, "Oh, we'll create a clearinghouse, we'll have a commission, and then we'll have the judiciary sitting there, and they're going to figure it out the right way." I don't think the courts have greater expertise or knowledge, or that they or any agency produce a more sensible result than Congress would by deciding what ought to be done.

So I've emphasized the problems of copyright's restrictions. I've given you the "economic" point of view. I have said what I think are the elements of proper "balance." I've given you the second of two sides, that must be considered when you look at the new technology problem, and last, I've suggested that Congress avoid asking the courts to make up a solution to the problem.

I think I'll stop. Thank you. [Laughter.]

Dr. BEARMAN. Thank you. [Applause.]

Thank you very much. That will not only lead into our discussion, but certainly into Panel 4 this afternoon, which is on the administration of rights.

Our second speaker this morning is from the publishing community. Karen Hunter is Planning Officer for the Elsevier Science Companies and the U.S. Coordinator for Planning, Research, and New Business Development. She formerly worked at Baker and Taylor Companies and at the Cornell University. She has a bachelor's degree and three master's degrees, including one in library science, and a business degree. And she's here in part, representing the Association of American Publishers.

Karen Hunter.

Ms. HUNTER. Thank you. That's an extraordinarily hard act to follow.

If Toni said she feels a little old at having been in this for 22 years, I'm beginning to feel like a dinosaur representing print publishers. I hope we are not outmoded, nor that we are something that will go by the wayside.

What I would like to do is talk, as Toni said, a little bit about exactly what do the publishers do now, how is that being affected by the newer technologies, and what issues do I see that are affected by copyright. For those of you, just briefly, for whom Elsevier is not a household word, Elsevier is a large Dutch publishing company. The scientific group that I am a part of is one of the largest, if not the largest, English language scientific publishers. We do about 500 journals and about 500 new books a year.

So what we're looking at is an international problem. We're looking at the international scientific community, the scholarly com-

munity, to a certain extent the business information. I can't speak to the question of consumer publishing.

Having said that, what is it that publishers do right now? There was a comment a few minutes ago that with the Xerox machine, everyone is a publisher. I think there's another computer related comment, if that's the case, and that's "Garbage in, garbage out." One of the things that publishers do in the very first place is to select, provide an editorial and quality control. That step means both identifying new areas for publication and potential authors, and then selecting among the various possibilities of things to be published.

We edit the material. That means both in form and in content. We design the physical format. We arrange for typesetting; in most cases, publishers are not typesetters. Typically, it's done by outside vendors. We make more corrections. We have the work printed. And, again, sometimes there's confusion. I don't mean to be condescending, but most publishers are not printers. We get them bound, we keep them in inventories, we advertise them, we market them, we sell them, we fulfill the orders, and we administer the finances.

Basically, we're a serivce organization, in other words. It happens to result in a manufactured product, but the manufacturing is done by others.

Typically, if you look at that for a written product, you're producing one at a time, and each unit tends to stand somewhat alone, and it's prepackaged for sale in that way. What's going to happen with new technologies and how is that going to affect or how is it affecting the way we do our business?

There are many ways; certainly, some of them just converting and improving upon our present practices; others that will be totally new. At the most basic level, we should, if an author has produced a manuscript, has produced a work on a word processor or on a personal computer, be able to take that electronic product in a floppy disk or in a cassette and use it directly in one way or another to enter the publishing process without having to re-keyboard it. It's a very simple idea; it doesn't work most of the time right now.

Why doesn't it work? In fact, right now, typically, if an author says, "I have my work on a floppy disk," you say, "Okay, fine. Great. Like to have it," knowing it's going to take you more time and cost you more money than to re-keyboard it. Or you'll say, "Okay, fine, but send us a print-out as well," so that you can use it to in put into the process. Largely because we don't have standards right now. We have no uniformity. If I do something on my Apple Writer II-e, on my Apple II, and I want to send that to someone else, there are black box systems that you can go in and out of converting, but there is no real standardization to make this a simple process. So right now, no one's saving much money on that. But that will come.

The Association of American Publishers, the Council on Library Resources, and others are working together to develop standards so that we will get some standardization so that we can use the electronic creations of our authors, the physical product to try and save money and speed the process.

That's a simple step. What are we going to do next? The big step that has to take place, and that's something that will take much longer among traditional print publishers, is to stop thinking in terms of producing one item at a time, one book, one issue of a journal, but to think about building or at least theoretically building data bases. That is, not just structuring one article, but structuring all of your information so that it has sufficiently common orientation and structure that you can merge it in one way or another, either with other things that you have published or with things which other publishers have published, to have a much more sensible, flexible kind of environment. What do I mean?

Let me give you an example. At Elsevier, as I said, we do more than 500 journals. Very roughly, that means that we do about 600,000 pages a year of journal literature, that we do about—we have 60,000 articles, 70,000 articles, that might involve 150,000 authors. Right now, as that material comes in, it comes into a factory, in effect, and you want to publish that information very quickly. Otherwise, it is no use to anyone if you don't get it out fast. You haven't really got time to do a lot of changes with it, nor, necessarily to think too much how it's going to relate to a journal that's done in another Elsevier office fifty miles away. You should, but you don't.

What we have to do in Elsevier and what we are doing is to make sure that we are doing each of these parts the same way so that electronically we can fit it all together if we want to, or at least that we can electronically search and access from one to another. And, ideally, we want to do it in such a way that we can go from our files in physics to the American Institute of Physics files in physics, using the same access mechanisms, and go to the American Chemical Society's files, et cetera. It's an enormous project, but the potential of what it will mean for information access is great.

So, data base orientation. Trying to structure our material in a retrievable way. And here I'm talking really still just about text. Right now, the technology is still not ready to handle graphic material, critical types of photographs the way we want. We have areas in biology, we have areas in geology, where people won't even accept a photocopy. They have to have the printed page for the quality they need in the reproduction. We're anywhere from five to ten years of having that on a widespread scale; I don't mean technically, but I mean widespread in use.

All right, so you get that far. That's still transferring present products to a different way of accessing the first product, or a different way of organizing the first product. What else can we do with technology? Well, then we can move from thinking about structure to thinking about the intellectual content. Is there a way we can link the intellectual content a little bit better? Again, I'll give an example from what we're doing.

We have a cluster of reference books in biochemistry and related areas—not just biochemistry, but in the biomedical area. We're starting to rethink these. We're not thinking of them as just books. We're thinking about them as paragraphs and as paragraphs which, from that whole group of books, should begin to come together and be accessible and relate to one another electronically.

To do that, to think about how you structure the paragraph level, to think about how you link words from one—in other words, creating again a large data base among a whole lot of words means a lot more intellectual effort has to go into how do you organize your work and you just can't take a manuscript from an author, edit it and publish it, and get something that you can use beyond that hardbound book.

Ultimately, if we can accomplish some of those things, I would say probably within eight to ten years, publishers like Elsevier and some of the other big scientific and business publishers will have some electronic data bases or archives in which all of our material automatically at the time it's created is also stored electronically, even though we're also putting it on paper.

Now, I do think that print on paper will be continuing. Now, even though we print now in very short runs; in a way you can't believe the things—we print a lot of our material in 200, 300 copies, a thousand copies is not unusual. To be under a thousand copies of a book is not unusual. In the world, there are only about 500 places that want, you know, information on a particular sublevel of neuroscience or something, and there are only so many copies you can sell. So it's automatic—the cost of printing is not in itself great, but you can't sell very many copies. The high price stays there. If we could store it all electronically and if we can begin to manipulate the data file more, then we can print on demand. We can print smaller units, and we can mix and match. That's going to happen far more than it ever has in the past. We're going to be selling paragraphs of information. We're going to be selling a chapter from this book and a chapter from that book, or an article from this on demand, and available.

Now, part of that's going on right now, if you look at the copy shops that exist next to universities, where they will on a professor's request photocopy a chapter from this book and a chapter from that book and bind it all together and sell it to the students. That's something that we object to, as publishers, rather strenuously, without royalties. On the other hand, we're sympathetic to the need. The way we package information is not necessarily the way somebody wants to use it.

So one of our jobs as a publisher is to make sure that we can do the same thing. That we are able to provide the flexibility that the market demands and has a reasonable right to ask for, and that technology makes possible.

Finally, there will be, certainly, as far as new technology for publishers, the kinds of new products that have nothing to do with what we've been publishing in the past. Software's the current example. I don't know of any large publisher that isn't also trying to publish software. They're going through it with fear and trepidation, but they're trying to do it.

I should say, by the way, a comment as to one of the things that was said before as to how much information or not. Our first big software programs which are coming out now—they're being announced at a scientific conference next month—we're giving full source code. We are going to tell the person who buys it everything they could possibly want to know about it. And with the idea that they can modify, maneuver, do whatever they want with it inter-

nally on their own machines. It won't be cheap, and we're also aiming at commercial markets where we assume that Company A won't copy it and give it to Company B because they're competitors, but we are trying to do it that way.

Okay, very quickly. Implications for copyright. Interestingly, I thought I would disagree more with what Judge Breyer said than in fact I did. I agree with a very large part of what he said. Certainly, from our standpoint, and I'll come back to this in a moment, we are economically motivated to get sufficient revenues to justify going on, not everything it may be worth. That's a whole separate question, but just enough to keep us going, thank you very much.

Now, looking for a Dutch company where you can't fire anyone, it's very critical to have enough money to pay the bills.

One thing on copyright now is the new technology. It's not changing overnight for us. It's going to take time. The issues that we're dealing with are critical, but most print publishers that I know are still concerned about photocopying, they're not so terribly eager to say we can't live with the present copyright law, it isn't providing for our needs.

Second, and that's a related change, there are a lot of changes going on in relationships among players. One of the things that these electronic data bases will do, in order to make good use of them, it's likely that you'll have far more sales directly to the end user. Instead of going through a chain that goes from publisher to perhaps bookseller to library to customer, you may go far more directly to the end customer. That upsets a lot of people, including some librarians—not all, by any means, but some are not sure of what their role will be. It also upsets a lot of publishers because they're not sure they can handle that. They're not so sure someone else isn't going to step in, realistically, and take over that whole job of information practicing.

What does that have to do with copyright? Only in the sense that you're going to be hearing from various people with vested interests, including myself, who are trying to protect our roles in the future. And I think some of the people who used to wear white hats may or may not be wearing them always, or at least, you have to be a little wary, including me.

The third thing, and I have to just stop briefly. There are people who are saying that electronic publishing makes copyright obsolete, and the example they use is what I consider the extreme example. That is, "Gee, I take and I enter a piece of work on a computer. It's on an electronic mail network. Somebody else comes by. They adjust it, they change it. Another person comes in, the adjust it, they change it. How can I protect possibly this thing? It has several authors, and it's changing in time. And, therefore—" and I have seen this too often now, from some reputable people—"therefore, electronic publishing must not be copyrightable. It must be just too hard to get a handle on."

I would say the kind of situation that's described to begin with, this electronic—iterative electronic messaging, may or may not be copyrightable. I have my feelings that there are methods that could be done, but I admit it's difficult. At the same time, no one puts a gun to the head of the person who starts the process. No one says,

"You must put your information in this system in such a way that its particular identity is lost." That's choice. Just as someone who puts out public domain software makes a choice that they want to put it out and freely copy. Some of them put their choice if they go into a system like that. In order to make a choice, though, you have to be able to also put it into an electronic system where it's protected. And I don't want to see that protection lost. I think it would be ironic, in a time that we are stretching and using copyright to protect any number of different things, to remove it from the protection of words simply because they're there electronically.

The two quick points—I know I'm out of time—in addition I would make if it's all right, is only twofold. One, because they are repetitions of other things. One, it was said last night that we should perhaps focus on use somewhat more, or at least a sense of copying. Maybe not entirely true for copyright law. I certainly would agree. I think that we have to think about compensation for use as much or more than compensation for making a physical copy or an electronic copy. And what use should be compensated.

Second, and that's the big question, is investment. Building data bases is not cheap. It's costing us more to do this than it cost to print and to publish normally. The intellectual effort that has to go into it is great, and we can't do it if we don't have some reasonable expections of a return.

Thank you.

Dr. BEARMAN. Thank you very much. It's very frustrating this morning, because I want to hear all of the speakers for an hour. I only wish we had more time.

Our third speaker this morning, we're going right back to the source, one of the people whose intellectual property we are talking about. Joseph Lash is the author of eight books. In 1972, he received the Pulitzer Prize for Biography and the National Book Award. And also, the Francis Parkman Prize. He was presented with the first Samuel E. Morrison award in 1976, and he is here speaking on behalf of the Authors Guild.

Mr. LASH. Thank you very much for including the Authors Guild in these discussions. At breakfast this morning, Dr. Boorstin made a very important distinction. He said, "We have been talking about information, but there is a difference between information and knowledge." There is, of course, a link, and the author may be the link. And it is important, when we consider copyright, that we not operate in such a way that we protect the holders of copyright who are chiefly the vendors of information and that we forget the author.

Somebody yesterday leaned over and said to me, "Where is the author in all of this?" And, indeed, it was a very relevant question and I appreciated it because, this morning, we have heard the word "author" used by Judge Breyer, only to have the whip applied to our backs, to suggest that we are a mercenary lot and we should be made to work for whatever it takes to persuade us and the less it takes to persuade us the better off the consumer is.

Well, I freely acknowledge that we are a mercenary lot. I don't deny that. [Laughter.] I don't know whether it distinguishes us from Congressmen and judges and others . . . [Laughter.] I think perhaps we all have that kind of self-interest, and perhaps it is

part of the virtue of the American system that we do have laws that protect that particular aspect of human nature.

I was reminded of Winston Churchill's statement about democracy, that it is a bad system, except for all the others, and as I was hearing some of the statements about copyright this morning, I wondered, well, what are the other systems that would work better. I think that I've been sent here—now this is going to seem to some of you, anecdotal, because I wrote my last book on a word processor. And when the Authors Guild was invited by the Library of Congress and Dr. Ladd to send a representative, they said, "Well, we'll send Joe Lash. He knows how a word processor operates." [Laughter.]

I had some other personal experiences that seem relevant in terms of the discussions we've been having here. I did a book about Roosevelt and Churchill, *The Partnership That Saved the West,* and that ended at Pearl Harbor, and my publisher said, "Well, why don't you go on and do a book about Roosevelt, Churchill and Stalin?" And I said, "Sure," and he gave me a good advance and I went up to Columbia where Marshall Shulman made me a visiting scholar so I could have use of the library, and they have a very good library at the Russian Institute, and I would read these marvellous books about Stalin and I would take them upstairs to be copied for me. The cost, in economic terms, was probably a little more than what I would have had to pay if I had gone out to get the book, except that a lot of them were out of print, but afterwards, I said to myself, "Well, now, I'll make use of this and I'll give him a footnote." And something in my mind said, "He probably would say to you, the author of the book, 'I can forget the footnote; pay me a hundred dollars for the citation,' " except that he didn't know about it, and my guilt feeling was not strong enough to make me volunteer to send him the hundred dollars. [Laughter.]

So there is a problem, of course, as we all have been acknowledging.

Well, I had the experience the opposite of that. I wrote some books about Eleanor Roosevelt, many of you may know, and we did a television program, "Eleanor and Franklin." And then somebody had the idea of doing a television program about Eleanor Roosevelt in the years after FDR's death that would focus on her human rights work. And so they went ahead and some of you may have seen that film, which had Jean Stapleton playing the part of Eleanor and doing a very, very good job about it.

Well, Jean Stapleton's agent whom I saw later said to me, "You know, I said to them, We ought to use your book, *The Years Alone,* and everybody just—they set their jaws grimly and said, we decided not to pay any attention to it." But I, of course, knowing my book very well, watched this film very carefully, saw lines that were similar. They obviously worked on the principle, this is all in the public domain and we'll see to it that it is not copied in such a way that it makes us liable to a libel suit on the thing, or infringement of rights.

So, it's both sides of the picture, and I understand that this is a very complex problem. I appreciated very much Dr. Ladd's analysis of the problem, before the World Intellectual Property Organization, because it was so sensitive and sensible about the problems of

authors, and I do think that our interests tend to get lost in this very revolutionary technology that is developing, in which the money and the battalions are really on the side of the people who are creating the floppy disks and the other software, et cetera.

But it will be a shame if the knowledge part, as distinguished from the information part, is lost sight of in the situation. Someone this morning talked about the brain drain, of the migration of great European intellects to the United States after the war. Well, there was another brain drain before the war. Some very great European minds migrated to this country, fleeing from Fascism in one form or another, and their names were people like Einstein, and Fermi, and Szilard, and they were the ones who had the idea of splitting the atom, and during the course of the development of the atom project, they became very exercised at first because they felt that the generals who had taken over supervision of the project—General Groves and others—were not sufficiently attentive to the need for haste in splitting the atom and getting the atom bomb, and that the big companies that were brought in to develop the atomic facilities were more concerned about their patents after the war than they were with getting this weapon in time of the war. They were wrong, on these points, as was shown later.

But later, at the end of the war, when Fat Boy was developed, and the issue came up, should the bomb be dropped on Hiroshima, people like Szilard, Fermi and others said, "Let's do it in a demonstration way. Let's not drop it on Hiroshima." And I thought afterwards, that here were the people with the long vision, that if indeed we had not dropped the bomb—you don't want a lecture on nuclear energy, but I'm trying to get at the difference between knowledge and information, here. If these seers, so to speak, had been listened to at that critical juncture, we might have been saved this great, terrible race that we're now facing in the world, so don't be forgetful of the people with knowledge, not that I'm for a moment comparing the authors and the Authors Guild—two minutes? I haven't started! [Laughter.]

Well, anyway, with minds like Szilard and Fermi, et cetera.

Someone asked me yesterday, "Well, how many authors use word processors?" And I had to confess that I didn't know. That in the Authors Guild we have talked about it, and there are a group of authors who have word processors. They are a group of authors who are very distinguished and who wouldn't go near one with ten-foot pole because they say it interferes with the creative process, but the fact of the matter is we at the Authors Guild don't know, and we should know how many authors are using word processors, what their experience has been, and et cetera.

The publishers have set up an Electronic Publishing Project in which they're trying to get a set of standards for coding manuscripts that could facilitate the procedure of composition and putting a manuscript into the works. We are a part of the Project, we're one of the stakeholders. The assumption is that we should learn these codes when they're finally developed, and when they send back the disk marked for electronic processing, we should know what to do with it.

Well, the Authors Guild has taken the mercenary view that if the publishers are to get economic benefits out of it, they ought to

share it with the authors and not load this thing on the authors, on the assumption, well, that this is the way things have gone traditionally. Indeed, speaking personally, it seems to me that if publishers want to move into the computer mode, and they would like us to prepare manuscripts on disks and send us back the disks coded by the new code they're developing, that perhaps publishers should consider that when they sign a contract with us that they also make available to us a word processing machine on which we can do the manuscript and send it to them. After all, in newspaper offices today and any of you who are familiar with a city room know this, there is a word processor at every reporter's desk. If a newspaper publisher can supply a word processing machine to his reporter, a publisher can do the same with his writer.

Well, I have--I see the time is gone. But let me just say that it is easy to forget the author, that we ought not to kill the goose that lays the eggs. Some of our eggs may not be golden, some of them may even stink, but don't kill the goose. [Laughter and applause.]

Dr. BEARMAN. I think the only thing criminal is having to cut short such excellent speakers. We are obviously going to go at least until 12:00 and those of you who don't mind delaying your lunch may wish to stay and ask questions. We will move along as quickly as we can. Thank you very much, Mr. Lash.

Jay Lucker is an old personal friend of mine, I'm delighted to say, so there's a familiar face to me on the panel. He has been Director of Libraries at MIT since 1975. He previously worked in senior positions at Princeton University and at the New York Public Library. He's active in many professional societies, was past President to the Association of Research Libraries, and a member of the American Library Association Council.

Mr. Lucker.

Mr. LUCKER. Thank you. I'll take the two minute warning in eight minutes.

Computers have revolutionized the way that libraries operate and continue to change the ways the libraries do the things that they have to do. Just to itemize some of the impact of computers internally, the advent of computerized networks has increased the speed with which libraries can catalog information and decreases the cost, by enabling them to cooperate in the cataloging of books, journals, and other materials. The transmission of this information through bibliographic utilities also enables libraries to use that same data base to exchange information on what they own. So the same data base that reflects cataloging information provides information for inter-library loan and photocopying requests.

Within libraries themselves, computers have been used and are being used to automate the way the libraries are organized. The integrated library system is a thing of the present, where libraries now have a single computerized system to enable them to acquire, process, catalog, retrieve, and display to the users all of their holdings.

Libraries are the principal users of on-line bibliographic data bases. Libraries are using micro computers for their own internal operations. Libraries also are the purchasers and disseminators of electronic information and other new forms of technologically

stored information, such as full text on video and optical disk, videotapes, audiotapes, and so on.

Libraries—academic libraries, particularly—are also part of a larger organization, usually the university, and the electronic revolution is now reaching onto the campus into what has been called the "wired campus." There are at least a half a dozen institutions that are presently in the process of wiring their campuses so that there is one large network. Three of them, Carnegie-Mellon University, Brown University, and MIT, have received large amounts of support from computer companies, such as IBM, and Digital Equipment Corporation.

The concept is that probably within the next five years, every individual on the university campus will have access to a large range of information. The information will be stored in a variety of places: the central computer facility, individual data bases, and the library. The proposal is that individuals could access the library's catalog, and could access external data bases through the library.

Now, obviously, one of the problems here is the control of the right to that information. It is unlikely that libraries will be distributing full text on the campus. People have been saying with the advent of the computer, it would be very easy to send somebody the information that they want. Well, with four million items stored in our library, for example, it's uneconomical in my view to transmit full text that is not already in electronic form to somebody on the campus.

What we see as the most likely outcome of the electronic revolution on the campus is that individuals will be able to know what the library has, where it is, perhaps most important, whether it's there or not, and then, to be able to request that information. But the delivery of that information will, in my view, most likely be through conventional forms, at least for the foreseeable future.

I've identified eight issues that I think affect libraries in the context of new technology and copyright. And I'll try to itemize them briefly. These are in no particular order of importance.

The first is the circulation and control of software and other easily reproducible information. Libraries have been and will be acquiring not only books and journals, but software, videotapes, audiotapes, cassettes, perhaps even chips. The traditional role of the library is to make material that it owns available to anybody who is authorized to use that library. The difference, I think, is as people have said, each person is his or her own publisher, and one of the problems I see is the problem of control of duplication once the material gets into the library. We have only limited ability to control what we have. Either we lend the material or we don't. It's as simple as that.

Once we lend the material, what happens to that material once it leaves our premises is totally out of our control. It's probably even out of our control within the premises, as has been seen in the case of coin-operated photocopying machines. But I would suggest that it would be impossible for libraries to control the duplication of material that circulates. And I would suggest that the most advantageous method of addressing this problem is in licensing arangements. That is, the right to purchase should also include the right to duplicate. It seems to me that that's one way of taking the

burden off libraries and also recompensing the publisher or creator for some portion of the cost of doing it.

I would say that we're already doing that, although the publishers are probably not admitting it, in the fact that libraries—somebody said earlier, I think, that publishers don't charge libraries more than they charge individuals. For books, that may be true, but they do it for journals. And libraries now pay three or four times the amount of subscription price individuals do. And it might be reasonable to say that the price of subscription might also include the right of copying.

A second problem in the area of electronic journal publishing, questions how to finance library subscriptions in a bimodal arrangement. As long as the items are being published in both print and electronic form, libraries will continue to subscribe to the print form. What happens when someone wants an electronic article quicker than they can get the print article? Who pays? And how much do you charge?

Another problem of electronic publishing as I see it is what do you do with the hard copy output. Now, people have said there will be no hard copy. Well, I can't conceive, for example, of receiving information in electronic form and trying to deliver it to somebody who doesn't have a terminal. So, inevitably, if you subscribe to electronic journals, you'll have to produce some sort of hard copy output. That hard copy output is in itself reproducible, and the problem, for example, of proliferation of a copyright item by the ultimate recipient is not out of the realm of possibility.

It is my view that libraries will deliver the hard copy to the user rather than store the hard copy and create a file of individual articles.

Third, optical and videodisk technology. This seems to me to have tremendous potential for libraries in the area of preservation. I understand yesterday there was a presentation of the Library of Congress Optical Disk Project, of which I am a member of the Advisory Committee. I think you should not underestimate the importance of this technology for preserving deteriorating library collections. We have reached the stage now where we can't even let people look at things that we own, because every time something is handled, it accelerates the deterioration. I think the preservation function of optical videodisk technology will both enable us to hold on to things that we have that are no longer usable, and also to be able to have the public make use of them.

Fourth, the role of the library as a purveyor of information is now being expanded into the role of the library as document deliverer. One of the things I'm concerned about is libraries taking on the commercial role of document delivery. That is, libraries providing photocopies and copies and doing data base searching for individuals not connected with their organizations and not paying the necessary fees and not paying the royalties.

I think as it becomes easier to provide these services, there's a danger that libraries, both public and academic libraries, will not be aware of the legal requirements. There is, as you probably know, a great debate in the library world about fee versus free. By and large, the public libraries stand on the side of everything being

free and the academic libraries realizing everything has a charge connected with it.

Now, how does somebody in a public library who's paying taxes, how do they access on-line full text data bases when there's a per unit cost for the service. Who pays for the copy? Do only people who can afford to pay pay? If the library pays, where does the money come from?

Fifth, telecommunications. One of the major problems in the adaptation of technology is the matter of cost. It is estimated that telecommunications charges will go up 60 percent this year, and that is a large percentage. And I'll give you just one example in the case of the library that I manage. The annual cost would go from $15,000.00 per year to $25,000.00 per year just for the cost of telecommunication with our bibliographic utility.

Again, the question is with all this telecommunication on the campus and in the towns, who's going to pay?

Sixth, the basic economic issue as I see it is that this is a zero sum game. I think there's an expectation on the part of some people that whatever is put out, somebody will buy it. Unfortunately, libraries particularly academic libraries, have only a certain amount of money to spend. And it gets increasingly difficult to get more money from our administrators. If we must spend money for new things, we will not spend money for old things. I think if there are electronic journals being published, then something else will not be acquired. I don't think that there's an infinite supply of money available to us and, therefore, I think that any program, any change, that requires, for example, the payment of royalty fees, the payment of licenses, the payment of additional charges, the cost of doing that will come out of the current budget and that something else will not be done. And if you think that that's going to be personnel costs, I think you're probably deluded.

Seventh, I think the university as publisher and other publishers should be concerned about the problem of deposit for copyright purposes of information in non-conventional forms. We publish about 15,000 theses a year. Within the last five years, the number of theses that have been deposited in the library that are not in print form has increased. That is, the entire thesis is now on a videotape. The entire thesis is on an optical disk. No longer in print version. The university will accept that version. What will the Copyright Office accept as a deposit copy?

And, finally, we are concerned about copyright protection for unpublished manuscripts. Most large research libraries are the repositories of manuscripts and archives of their faculty and of other authors and we are increasingly concerned about the rights, both of the library and of the person who deposited the material and the heirs and the estate.

Thank you.

Dr. BEARMAN. Thank you very much, Jay. Our final speaker this morning is Warren Spurlin. Dr. Spurlin is Deputy Superintendent of the Sarasota County Florida public schools and has 26 years of experience in public education, 22 of which were at various levels of administration, ranging from assistant principal in the junior high onto various other positions. He has an earned doctorate, education specialist, masters and bachelor of science degrees from

Wayne University; Detroit, Michigan; Michigan State University; and the University of Miami. His recent experience includes participation in the MIE National Conference of Producer Educator Perspectives and Educational Software in D.C. And he's authored policy statements to control copyright violation of computer software and mandated staff development in this area for the service of the school district which has drawn national attention.

Before turning the lectern over to Dr. Spurlin, I want to make one correction for the record. Although I had been told by one or two of our speakers that they were representing particular groups, apparently that is not the case. They are here completely as individuals and they are not speaking on behalf of any organization or agency.

Well, Dr. Spurlin.

Dr. SPURLIN. Thank you. My first point is to file a disclaimer. I think the structure of the panel might indicate I would be representing the National School Board Associations' point of view or the AASA point of view. I'll try to do that, but this will really be my interpretation of their point of view. That's what you'll get.

I'm going to try a different tack. To try to condense the impact of what's been talked about in these past few days, and will be talked about tomorrow into ten minutes is irresponsible, so I'm not going to try to do that. I am going to give you a little different dimension about what's happening in public education as a result of the growth in computers, both from the mainframe down now to the micros.

If you'll recall, it wasn't too many years ago that the advent of television just hop-skipped right across education. There were a few lame efforts, sponsored mainly by federal funds, to bring televison into the classroom on a massive basis and it failed miserably. You all remember the planes that flew around over Indiana trying to broadcast in Detroit or Chicago and things like that. By and large, public television was the beginning point—public television broadcasting was really the beginning point of bringing television into the classroom. It did not emanate from the schools or the school people themselves.

The same thing was just about to happen with micro computers. Micro computers, in essence, had leapfrogged the school systems into the homes, and it was only through, I think several coninci-dental things that brought the schools alive in the aspect of using micro computers for instruction and for management. One (coincidence) was the availability. People just literally dumped micro computers on the schools. The academic mind set is not to grab something like a micro computer, throw it into the classroom and start instructing with it and say it's a good idea. The mind set is to want to file it, to do experiments, to collect data, to review the data, to verify the data, and on and on and on. The public did not allow that to happen.

The legislators, from California to Florida and back and forth, mandated things like computer literacy. And corporations like IBM and some of the others just literally unloaded micro computers on the schools. There was legislated, and still is legislative activity, to try to get tax breaks and so forth for what we call the Apple Belt.

These things impounded and impacted upon education in such a way micro computers couldn't be ignored. So we were not necessarily a willing participant in this mushrooming of the micro computer, the software that goes with it, and its impact. Additionally, it was particularly humbling to edcuators to have it coming off of a game format into the classroom.

So you can see, now you've got a mind set out here that may not be as open as it appears, even as you listen to advocates of micro computing from within education. And along with that, about a year and a half ago, all these reports began to come out about how poorly public education is doing in many areas, these really created even more excitement in the educational community. This was good for education. So, with that excitement, with that history, it brings us to a point on a Sunday morning at Fort Lauderdale where we're talking about things like copyright violation, the types of protection for authors, a lot of things which frankly educators have paid little or no attention to.

Now, we have taken in Sarasota County and other counties—we're not that unique—we've taken the opportunity to use this copyright issue to work for us. We have a tax spenders mentality, and I think you don't want to use public education as the vanguard for making determinations about copyright issues. Because, very honestly, the issue of whether you try to protect someone's copyright or you spend a few dollars, or you try to get around a copyright when you're spending tax money is different than when it's coming out of the private sector. And I don't mean that in a negative way. It is just different. The easy answer is to pay for things. The better answer might be something else.

And, to try to get a few points across in this brief time, let's not forget that micro computers are in a way a significant redevelopment of the mainframe computer that's been around forever. The mainframe computer was a very positive and powerful tool for education, just like it was in business, and we used that mainframe computer for classroom-assisted instruction, curriculum-assisted instruction, just like we're using the micro in those ways now.

But the way the software came about was through a licensing process. And the copyright issues for software have really only developed in the educational sphere since the micros have become so available. So maybe we need to look back a little bit into history, at least in the field of education, to take a look at how we licensed the software or the driving ware for those big computers. It worked, and it worked fairly well. And something must have been right because, as you all know, the development was astronomical in terms of time.

I was asked to take a little bit of a look at the future. We do a lot of things right now with the computers: mainframes, micros, and even the resurgence of what we used to call the mini computer which went out of favor. Right now, there are school districts in the United States, which have a computerized relationship between television, computer, with two-way communication capacity. There are mandated programs where there's a low incidence of student participation. There are, in fact, legislatures demanding that you teach something that you don't even have a teacher in your district that can handle. Or if you do, you have only one and you have four

schools that must be served. There's no question about the possibility—the strong possibility—of delivering these mandates through networks of television, networks of micro computers, networks of heavier computers. So that's happening.

We have programs right now—we participate and many others do—where the information about college entrance, about scholarships, about changing requirements, are all computerized and can be accessed daily by the youngsters themselves in counselor's offices. That's a growing thing. Your imagination is your only limit to what kind of networking can do.

Another area is the area of responders. I haven't heard that mentioned. I'm not a technician, so I don't know where that all fits in, but if you could think of a lecture hall like this with all your micro computers set up in a responder system where the instructor can stand up here, make a point, and ask how many people got that point based on something he'd written down, they punch a button, he knows how successful he's been immediately—that type of instruction is going on. We use it a little bit now in training for our medical people, in adult ed. But that type of technology is tied into computer because the print-out that comes out gives the teacher one hundred percent information on the level of understanding of each student. But that's all right there. It's just a matter of expanding the technology, bringing it into the classroom.

Now this concept of downloading. I hate to use that term because it just wasn't a nice term, somehow. But we have situational requirement set up now. This procedure is a real problem with many copyrights. We buy programs, we bring them in, we put them on what we call a master computer. Out there sits 15 to 20 what we call slave computers. Every 55 minutes, a new youngster comes in, sits down. He has an individualized program programmed into the master computer that's downloaded to that little unit, the slave out there, for that larger micro computer. Six periods a day we do this, back and forth, back and forth, back and forth. Now, we do this under a licensing agreement. This process is going to be happening more and more.

We (educators) go out and buy our software. We have a policy in our district that we have to negotiate with the vendor before we'll allow anyone to buy software. The buyers have to show evidence—there's a regular process—that they tried to negotiate. At the point that we can't negotiate a copyright release or relief. Or at a point in time when we can't license in a more favorable way, (before we purchase), there is then an administrative review. Sometimes, even if we can't negotiate a deal, we go ahead and buy. If there's no equivalent, and it makes sense, we'll do it.

But this marketplace idea is working very well, and it's the larger companies, quite frankly, that are willing to negotiate with us more often. These kinds of things are happening.

One of our biggest problems, mentioned here, is as educators on a national basis, we subscribe to journals by the hundreds, and we pay heavy fees to subscribe to those journals. And then the journals come out with articles that are germane to something we're doing and have widespread application and we feel we have a right to make some reasonable copies and distribute those to various staff. We're having a battle. We're having a battle with the School

Board Association over the School Board Journal with the administrative group over their magazine. So there's got to be some new concepts in licensing arrangements if in fact the school districts are not going to be forced to become dishonest.

My last point. It was said several times today, and let me say that I just don't see any other way around it. We're talking about something called education. And in our school district's policy on copyright, we require every teacher and every student to go through a program that we call computer literacy. A big component of computer literacy for the teacher group is the understanding of the copyright laws and the ramification of those laws as they are applied to education. A large component for our youngsters in computer literacy is an understanding of the law around computers. What it all means, the software, the hardware, their values, their relationship. And if we get to the point where we have a computer in every home, as we now have a TV set in every home and we get the schools working with software that can be interchanged, a sort of library for classroom, home and community use then you've got a hell of a relationship between home and school that we never could have had otherwise. That relationship is going to develop. As this relationship grows we're going to have a gap if we're not careful, because every home isn't going to immediately have a computer terminal, and every home isn't going to have a TV set. So if you begin to design your instruction based on that mode, then somewhere we got to provide for filling the gaps between the micro computer haves and the have-nots.

I'm sure I've distorted everything and I appreciate your time. Thank you.

[Applause.]

QUESTIONS FROM AUDIENCE

Dr. BEARMAN. Thank you very much. Well, we have heard five excellent presentations from producers, distributors, and users, in looking at both private sector and public sector concerns. We would like to take questions first from the members of Congress, our primary audience, if you have any of those. Any member of Congress wish to ask a question?

Mr. CONYERS. Yes, John Conyers here. I would like to ask Mr. Spurlin whether he considers the use of computers the wave of the future in public education. All of us in the Congress have been deeply involved in educational issues. In some communities, it appears that there is pressure put on, sometimes by parents and sometimes by people that think it's the way to go and they're disturbed that their school system isn't doing it, there is that gap that is being discussed between those poor communities where there is no preliminary effort, and then there's always, as you mentioned briefly, the game syndrome and what that might do to a youngster. I was just thinking that many of them hang out in arcades, but when they come to using a computer in school this may seem something that they may not want to indulge in. So I would like to get your feel for where this thing is going in education.

Dr. SPURLIN. Very quickly, if I could go in reverse order. We're hoping that the game syndrome will be reversed. We know that the

game syndrome brought it on, but we feel strongly the computer is a powerful enough instruction device, it'll overcome that.

Now, jumping to your first question. There's no question that the micro computer is the trend right now. It's really too early for me to have a personal feeling about its value as opposed, let's say, to a teacher in the classroom or to a textbook that the youngster can take home. But the data has turned around. The data from 1960 through 1968 did not indicate that computer-assisted instruction made significant differences in learning. The most recent data, using the different programs, the better software—I didn't even begin to know how poor the software has been up to the last few years—so anyway, my point is I think it's turning around. I think you have evidence now that computer-assisted instruction is as good or better than traditional instruction.

I think it's something we have to watch now. I think it's going to be a powerful, powerful tool in the classroom.

Dr. BEARMAN. I'd like to add one short comment to that. Having worked in all of the areas you've heard about this morning, the concern that I have is that we harness the technology to do what we want it to do. It bothers me to think of an author who must sit in front of a terminal who would prefer to take his yellow pad outside on the hammock or something. In many cases, we are restricted by technology. I think we should go back to the original Greek root of the word, "techne", which is a systematic interweaving of arts and crafts. It says nothing about hardware. And we must make sure that we're in control of that technology, and not let it come in and tell us what to do. I think we're hearing a little of that where the computers have come into the school and nobody had set the goals that they wanted to use these computers for.

Another question? Yes, sir.

RESPONSE FROM AUDIENCE. I'm wondering about the equity for consumers in all of this. You have a certain group of captive consumers who are going to pay, can't get away from paying. Now we're talking about promiscuous copying which will provide another class of consumers who will not pay anything. What will be the effect on captive consumers? Will the costs be uploaded on them? [Laughter.]

Dr. BEARMAN. Would any panelist like to take a stab at answering that one?

Ms. HUNTER. I think—I hope not. Certainly, that's what has happened in our area. I don't know what publisher who publishes journals who can say and defend the fact that photocopying has in fact resulted in significantly fewer subscriptions, but we certainly feel that it's a contribution to it, and the end result has been those who continue to buy it pay a higher price, yes.

Now, what I hope is, and as I said, in the future, we should have more flexibility in how we sell and I hope that we can develop pricing mechanisms and market mechanisms that mean all users pay a lower, but fairer price.

Dr. BEARMAN. One of the questions that has been raised to the library community is about the non-captive consumers. What about the widening gap between the information rich and the information poor? Those who can't get access to material in electronic form only. And I think that an important question to keep in mind here

also, is the need to distinguish among costs and price and value. We can determine what a product cost and maybe that cost will go up. We can determine what the value is to society which is one of the major concerns before Congress at all times, what is in the interest of society to do. The pricing can be handled in many ways, either passed on directly to consumers, subsidized for certain groups, et cetera.

I think often those three get confused and it's essential to keep them separate from one another.

Other questions? Yes.

RESPONSE FROM AUDIENCE. Well, if the consumer's going to pay a lower fair price and we have all this pirating that's going on and there's no real protection for the author and for the people that produce the materials, is there going to be the incentive, let's say, to put out a quality product to begin with?

Ms. HUNTER. I don't know for sure. I can only give you an example. I hope so; otherwise, well, I don't know. Yes, I think so.

We're considering right now a package in the scientific area that every group of scientists we talk with in the market test about, absolutely agrees that it will be a dramatic improvement over what's available now. It is not clear to us now that we can afford to put it together, or that the amount of non-compensated use—that we can structure it in such a way that the amount of non-compensated use will cover cost of building it. I don't know. I don't have a good answer for that.

Dr. BEARMAN. Jay, you wanted to add something?

Dr. LUCKER. Motivation for publishing scientific, scholarly, technical information, is not financial. First of all, the rewards as Judge Breyer said, are different. Secondly, rather than receiving payment for publishing, in many cases you have to pay to be published. Page charges, for example, are still a way of life in many scientific and technical areas.

In addition to which, the cost of doing the research, in many cases, is borne by the United States Government. A great deal of basic research and the applied research in this country is funded by the United States Government, and, therefore, the output, the publication is in a sense being subsidized. In fact, I've always found it somewhat ironic that in this area of sponsored research where the cost of doing the research is paid for by the taxpayer, and the fruits of the research are being disseminated by the publisher, a lot of the taxpayers are paying a second time to get that information.

I don't think that at least in the area of scientific and scholarly publishing that it will inhibit output.

Dr. BEARMAN. Yes, sir?

Mr. FISH. Ham Fish from New York. Mr. Lash, yesterday you saw a slide that, as I recall the figures roughly, the author got about 5 percent, the publisher 35 to 40, and the distributor, the second largest share of the profits. Your message to us was don't forget the author. I wonder if you care to elaborate as to what we should have in mind so as not to forget the author.

Mr. LASH. Well, I was thinking, Congressman Fish, basically of the terms of the electronic publishing project that if there are savings to the publisher as a result of our coding these manuscripts

that part of the savings be passed on to the author and not just held by the publisher.

I do think that this is not a—it can't be answered by general principles. Anyone who's read the history of the struggles in the code authorities as to whether the consumer is going to be forgotten as between the determination of the administration to raise prices and the trade unions to raise prices so they can get higher wages, and the industries will remember that the consumers had a chance, only because they were well organized and represented by Mary Harriman Rumsey, and when she died, then the consumer thing fell apart, the consumers were forgotten.

Now, I think it's in part a challenge to the Authors Guild that there is this onrushing technology that we have to be aware of, we have to be represented at meetings such as this and other comparable meetings in Congress, Congressional committees, so that we are not forgotten.

But I don't have any particular formula for the purpose.

Ms. HUNTER. I'd like to make one other comment that if the slide that you referred to yesterday morning—I was not here for that, so I regret that I can't respond except the figures you quote don't make sense for the kind of publishing that we have done. I have worked out if you took a typical $40.00 professional book, if that was the list price, indeed the largest section of that, perhaps 25 percent, would go to the next step in the sales chain, so that's your wholesaler or your book store or somewhere in that range. About 20 percent for physical paper production and binding, printing; 15 percent for other marketing costs; 5 to 10 percent for your editorial R&D kind of development, your cost of handling and thinking about acquiring the material; 10 to 15 percent for general overhead. In other words, 80 percent approximately are direct cost items. That leaves you with something that gets between the author and the publisher, and typically, it is 60 percent author, let's say 40 percent publisher. That's maybe 12 percent to the author, 8 percent to the publishers. So the 35 percent figure, I'm not quite sure who's getting that. It's not most publishers.

RESPONSE FROM AUDIENCE. All right. I believe I could clarify that. That was actually software publishing that was being quoted yesterday. It turned out not to be totally inconsonant with book publishing, but . . . .

Dr. BEARMAN. Thank you. Congressman Smith?

Mr. SMITH. I'm curious about after having heard some of the panelists give their competing philosophies, and they are in fact—I'm curious as to whether anyone would hazard a guess on these issues. The first issue is whether or not we can write a comprehensive law which would in fact be sufficiently broad, yet sufficiently specific, to be protective of the area we're trying to protect; and secondarily, if that's not the case, would we then have to break down copyrights like we have never done before into specific areas of knowledge or information, or use, and literally deal with the subject on different levels for the different dissemination modes.

Dr. BEARMAN. Who's the brave panelist to start this response?

Mr. BREYER. Those are the questions that I wanted to raise. The issue is: will the "material" be produced? The kind of protection appropriate for Walt Whitman, or a "trade book" author, could be

totally different from the kind of protection that is proper in some other area. Can you separate, or distinguish the areas in question, one from another?

The way I'd go about breaking them down is to get Professor Lucker and a list of economic factors in favor of, or against, protection. I'd see if it's possible, for congressional staff to go through each of the products asking for protection, area by area, and develop tentative ideas about where the case for protection is strongest. If we do not know, we can refuse to provide protection—we can wait and see if a big production problem develops—and then, if it does, we can reconsider our earlier decision.

Mr. SMITH. Well, assuming it would be possible to break it out, how would you get around equal protection?

Mr. BREYER. The reason one would distinguish among products or areas is to see if in say Area X, the need for the protection to obtain production is greater than elsewhere or the risks that the protection will interfere with dissemination of material might be unusually small. Such reasons are sufficient to justify different legislative treatment and to avoid any equal protection problem.

Mr. SMITH. Thank you.

Dr. BEARMAN. Jay or anyone else, would you like to comment on that? I guess we're all hesitant because we're not lawyers. The question is whether a single piece of legislation can cover it.

My hesitancy in looking toward one piece of legislation is that so much of what we've been hearing about and from what I know from data base producers, must be protected by licenses and leasing arrangements. The other problem I see is that we have so many different segments of society. I think that what Dr. Spurlin was saying is we cannot treat the users all the same way. We cannot treat the types of information all the same way. Knowledge and information are indeed very different.

So I guess my response is a tentative no to the first part, and I think it's going to take a rather large coalition to come up with alternatives to do that.

Yes, Dr. Boorstin?

Dr. BOORSTIN. I would like to add a word or comment on what Judge Breyer said and what Congressman Smith said. Judge Breyer was observing on the need for restrictions to bring about the production of the product, the imaginative product. I would like to suggest that that might be a usable principle in the case of the less important, the less revolutionary, the less basic artistic creations. But if we look at the history of the great works, imaginative works in literature, I think that the one thing we can say about them is that their production was unpredictable. Perhaps if we would produce a tyrannic, tzarist society, we might produce some Tolstoys and Dostoyevskis. That wouldn't be worth the price.

And what I suggest is that what we really are concerned with here is to create a society, an atmosphere, and this goes back to something that Devine mentioned this morning, create a society in which we will encourage the unpredictable; that is, encourage productivity for reasons we can't quite understand which means then that what we're doing with compensation is not to provide an incentive to the great creative artist, but rather, we're creating an atmosphere of freedom and spontaneity and rewards for creativity,

and the rewards for that compensation go to the whole community because the community which values creativity and which has the satisfaction of rewarding its artists is a richer, more productive community than one which measures the compensation in a more purely economic way.

Mr. BREYER. One idea that's always intrigued me is the moral right of the author. European countries have specifically given such protection. We have not. Should we do so?

Dr. BOORSTIN. Society profits when the community rewards those people who produce creative work even though they didn't produce the creative work for economic reasons.

PANELIST. I might say in support of your position, Dr. Boorstin, that the Institute of Advanced Study that was set up primarily to house Einstein, was not based on the copyright principle except that it was to create an atmosphere in which the mind like Einstein's could work congenially. And the most important part of it may have been that they should be peers so that there was an intellectual test and creative test for the other kinds of people that were brought in.

Now, I wouldn't, for a moment, seem to disparage that incentive as part of it, but I do think it is fundamentally based on the copyright system as it exists in the country and that if we throw that out, we may be throwing out a lot more.

Dr. BEARMAN. I think we also have the question of what is it that we're protecting. If it is an idea, that's one thing. Are we talking about not protecting electrical impulses. So the technology that we originally set copyright up to deal with was developed in the fifteenth century, and now we're dealing with quite different technology.

Yes, sir, one last question. I understand we have to close at 12:15, so, please.

Mr. KERNOCHAN. Yes, John Kernochan, Columbia. I found Judge Breyer's presentation very stimulating and I agree with him that differentiation between kinds of copyrighted material is absolutely vital. I sympathize with him, in having reread his article. I think that it might also have been useful if he had read further in Macaulay who he cited in support, and I'd just like to read for a moment what Macaulay did say in 1856. It's still relevant to copyright revision.

He says, "The advantages arising from a system of copyright are obvious. It is desirable we should have a supply of good books. We cannot have such a supply unless writers are liberally remunerated, and the least objectionable way of remunerating them is by means of copyright. You cannot depend for literary instruction on the leisured men occupied in the pursuits of active life. You must not look to such deep meditation and long research. It is then on men whose profession is literature and whose private means are not ample that you must rely for a supply of valuable books. Such men must be remunerated for their labor and there are only two ways in which they can be remunerated. One of those ways is patronage, the other is copyright. I can conceive of no system more favorable to the integrity and independence of liberated man than one under which they should be taught not to look for their daily

bread to the favor of ministers. We must betake ourselves to copyright in spite of the inconveniences of copyright."

Mr. BREYER. I agree with it. But also remember the most famous Macaulay statement of all, when asked to support a reform bill, he said "Reform? Reform? Don't talk to me about reform. We're in enough trouble already." [Laughter.]

Dr. BEARMAN. Well, with that wonderful demonstration of information retrieval [Laughter.] thank you, sir.

May I thank you all very much, and please join me in thanking our excellent panelists.

[Applause.]

AFTERNOON SESSION

MASS MEDIA DISTRIBUTION: THE FUTURE

Mr. GOLDSTEIN. We're ready to begin this afternoon's program. This morning, we heard about information processing and also the importance of technology in terms of new questions concerning education, library and publishing. This afternoon, we're going to begin more in the vein of the entertainment industry in a sense, concerned with the distribution of programming, either films, broadcast programming, sports programming, and the like, and the questions that are going to be raised in these areas as we move on towards the 21st century.

We have an excellent panel and an excellent moderator. Our moderator today is Professor Harvey Zuckman, who teaches at Catholic University Law School, the Columbus School of Law in Washington. He also serves as the Director of the Law School's Communications Law Institute and, in addition, he is a part of the Montgomery County Cable Advisory Committee, Montgomery County being in the State of Maryland.

And, without further ado, I'd like to turn it over to Harvey.

Mr. ZUCKMAN. Good afternoon, and welcome to Panel Number 3, which is Mass Media Distribution, The Future. Or, it might be entitle "What Has Modern Technology Wrought to our Audio and Video Terminals?" Because of rather severe time constraints and the desire to have plenty of time for cross-discussion and questions from the audience, introductions of our distinguished panel will be brief. This is an extremely fine panel of experts.

Before I begin, however, normally I don't tell stories in opening programs and that because one, either I can't think of an appropriate story, or two, I mess up the punchline. But I want to share with you a story that, as God is my witness, is true.

Last night, in walking down the corridor toward the reception, I happened to notice four waiters in their waiters' tuxedos outside the ballroom where I believe the Jewish Federation of Greater Fort Lauderdale was having its dinner dance. And much to my amazement, I heard one waiter say to the other, with some passion, "No, you're wrong. The copyright stays with the author!" [Laughter.]

And the other one says, "No, it can't be. It belongs to the publisher!" [Laughter.]

And, you know, I was just sort of dumbstruck by this and I guess because of that, I didn't intervene in any way and I went down to

the reception and told a few of you this story. Later that evening, I called home to find out how everything was and I shared the story with my wife and I thought she would just laugh and be amused. She said, "Why didn't you intervene? Why didn't you go in there and answer their question?" And I said, "Well, one reason is I'm not sure that I would have known what to say until I've heard all the panels today." [Laughter.]

And so, if those four waiters are out in this audience somewhere [laughter] let me just say that after this panel, I would be very happy to discuss the situation with you. [Laughter.]

The panelists, and I will just list them briefly now, and then introduce them at a little more length as they come up to speak, are to my immediate left, Bryan L. Burns, who is Director of Broadcasting for the Office of the Commissioner of Baseball; Mel Harris, President of Paramount Video; Gus M. Hauser, Chairman and Chief Executive Officer of Hauser Communications; William Lilley, III, who is the Vice President of Corporate Affairs for CBS, Incorporated; and Clyde Washburn, who is Chief Scientist for Earth Terminals, Incorporated.

The topic for this panel, again, is Mass Distribution: The Future. More specifically, the panelists are called upon to discuss the impact of the new and future systems of mass distribution of news, information, and entertainment upon the traditional rights of the creators or owners of intellectual property. Perhaps the model for copyright protection that began sometime after the development of the printing press no longer serves the needs of either the property owner or the public, generally, in this post-industrial technological age. That, of course, is not for any one particular person to say, though I think the collective judgment ultimately will have to be made.

But if this is so, what are the Congress and the courts to do in the long run to mediate conflicting interests? Before I pose the first specific question to get things moving, I just want to again admonish the panel that we're going to try and stay on time as best we can, and to limit your remarks to five to seven minutes.

The one general question that I would pose at this time, and you may have others during the cross-discussion, is what will your industry look like, technologically, in five or ten years, and what intellectual property issues do you foresee.

Now, our first speaker is Bryan L. Burns. He is Director of Broadcasting in the Office of the Commissioner of Baseball, and I would venture to say there must be at least 10,000 people out there that would love to have Bryan's job. And almost all of them have contacted him about that.

Prior to joining the Commissioner's Office, he worked with the Kansas City Royals in public relations and as Director of Marketing and Special Events. He holds a bachelor of science degree in communications.

Mr. Burns.

Mr. BURNS. Ladies and gentlemen, good day. I was at the pool yesterday, reading this magazine. I would think most of you are familiar with it. It's called "Channels." It's a bi-monthly publication that provides some in-depth, interesting reading about the communications industry. I ran into an ad inside, advertising the publica-

tion itself. It has a little tear-out card for you to send in and subscribe. And it lists various topics that the magazine covers, including public television, computers, music videos, and, among others, video sports.

In the little video sports subsection up here in the corner, it says in part, "What does it say about society when a club owner refers to his team as 'software'?" [Laughter.]

Well, what does that say? Let's talk about that. It quite simply says this hypothetical team owner who's made a financial investment, a creative investment, an organizational investment, and among other things, a management investment should have the right to be offered a measure of protection against another party's desire to take the final product of that work and re-offer it in the marketplace.

What makes this statement that refers to a club owner's view of himself as software so emotional? What makes it valuable to be used to sell this publication? Why is that supposed to work? Why is it supposed to motivate me to take this card, cut it out, and send it in?

It's the terminology. And the terminology is a function of the technology. The technology of mass media distribution in the future, and that's why we're here. My seeing that yesterday was, to say the least, quite timely.

What we are dealing with here is incredibly simple and yet everyday these topics seem to become increasingly complex. The complexity comes from the technology which we can use to better facilitate the distribution of our products. However, the technology, at the same time, opens the door for others to take advantage of the works our efforts create.

I've noted with interest the concern voiced by the movie folks who are engaged in the satellite distribution of HBO, Showtime, Movie Channel, Cinemax, and so on. Some say the effectivenesss of satellite distribution outweighs the downside of piracy. I guess we in sports are somewhat in the same boat, because we use the technology, too. However, we really have a hard time understanding why there has to be any downside at all. It is obvious, however, there is no simple solution to that problem. We in sports have been very alert to the new technologies. In baseball, we're very deeply into it, taking advantage of it. We're striving for the most efficient variety of choices, choices which include national network television, local conventional television, and local or regional pay television.

Amidst all the concern about sports franchises taking games away from conventional television, we continue to advise our clubs in baseball that it is not in their best interests to do so, and all the clubs agree. They are in total agreement. Continued use of conventional television is exceptionally important to the marketing of our game.

We do, however, have at least seven clubs who in 1984 will start a local or regional pay television operation. I think you'll find it interesting that industry-wide baseball will add over 500 telecasts this year and lose less than 10 percent of that number of conventional television. Our new six-year contracts with NBC and ABC set the stages for the display of more games than ever before on

national, local and regional free and pay television. Our bottom line in '84, and the sort of medium range future, is that we will see little change in the number of games available to the public and we will continue to rely very heavily on conventional television as a vitally important part of the marketing mix.

During this period, I think you will see most of our franchises find ways to utilize *all* of their games. I guess I should say all of the software they were not using in the past. We strongly believe that the consumer, in the end, will be better served than he is today.

But what happens when new technology comes along and captures product for distribution without the owner's control? The starting point for any such discussion should be that an author or producer's work is recognized as his and should not be controlled or distributed by outsiders. Unfortunately the regulatory system has distorted that reality.

Our current recourse is rather sloppy, rather abrasive. To call attention to the piracy situation, we usually have to get involved with the consumer and enforce the ownership rights of an author or a producer. It's somewhat like allowing a locksmith to sit outside the bank and sell keys to the vault and then, when somebody comes outside with the money, we turn to the Congress and the Copyright Royalty Tribunal to assess value to be received for the use of the money—value from those individuals who purchased keys—not the locksmith.

As we head to the future and all of the complex choices and opportunities that technology will bring to us, there is a need to revise these rules which allow the proprietary rights of program producers to be circumvented.

This is a kind of crystal ball weekend for you, to look ahead to the future and visualize what opportunities will be available to us by the end of this decade and on into the next one.

As regards the sports product, I think we are in a period of transition with regard to the shaping of the sports business by technology. Does hardware drive us to pay-per-view? Or will the programming opportunities that are available drive the local operators and MSO's to step forward and take the capital intensive step to addressability? Our baseball clubs' actions, I think, have spoken for themselves. We're not going to wait for the wheel to be invented. We have 20 of our 26 clubs in pay television in '84. All but one are involved with a local or regional sports channel of sorts that combines various programming for a monthly fee, not unlike the movie channels which you're all familiar with.

Most of the contractual arrangements in pay television call for four, five, or more years duration. Past that, it would appear that the consumer's choice will be even greater. Built on the top of the base of local and national conventional television will be a virtual plethora of choices for the viewer: monthly, by event, by sport, by day of the week, with potentially a lesser cost for viewing on a delayed basis. The list of possibilities goes on and on, and the list will be regulated by the available technology.

The focus for today's corrective look to the future should thus be somewhat simple. For marketplace to work and allow the choices that will be available to the consumer down this technological

road, there is a need to build upon a base of protection for the program producers. It is not only financial and creative interest that will be at stake, but really also the marketing decisions that are made as additional products are taken to the marketplace.

If you'll recall our banker from a few moments ago, his decisions as to what financial products to offer to the consumer in the marketplace will be a lot more realistic if he knows the locksmith won't be at the door with a sign that says, "Buy your keys here." We really are no different. The sports interests will only be able to realistically decide how to go to the marketplace if we have reasonable assurance that we can control our product without others having the right to take our products and compete in the marketplace . . . and compete without incurring the upfront costs we will continue to face.

In short, let's stop the locksmith by now considering measures that will deter him from going to the bank's front door.

In behalf of all the sports' interests, we thank you for the opportunity to be here, be on the panel, to interact with you, and to help you analyze your thoughts on the distribution of our software in the future.

Thank you very much.

Mr. ZUCKMAN. Bryan, can I ask you just one question. What is MSO? You referred to that.

Mr. BURNS. MSO stands for Multiple System Operator, which is normally a company that owns a number of cable systems, either regionally or throughout the country.

Mr. ZUCKMAN. Thank you. Let me just suggest that the panelists will try to avoid the alphabet soup of mass communications. There are some of us who don't recognize all the letters.

Our next speaker is Mel Harris, who is President of Paramount Video. Mr. Harris has worldwide responsibility for the programming, production, and distribution of pay television from video and supplemental markets. He holds positions on the Board of Directors of several major corporations, including USA Cable Network, CIC Video—that deals with international programming—and the United Press International Pay Television, which is based in London.

He came to Paramount in 1977, and before that was engaged in commercial broadcasting. He holds three degrees in mass communications, including a Ph. D.

Mr. Harris?

Mr. HARRIS. Thank you. One correction. That's United International Pictures Television. They all are international pay television organizations.

Let me first say that Mr. Spock, John Travolta, and Jennifer Beals are not data bases. [Laughter.]

So we start from somewhat a different point of view in terms of copyright. It has been a concern for motion picture producers and television producers for a long time before data bases were invented as a phrase.

Copyright has never been more important than now, we feel, and the public has a great interest in it because as we move from an industrial society into an information society, more and more people are going to have their jobs dependent on copyrighted mate-

rial. And when a person's job is at stake, they get very interested. So we think copyright is very important at a very prime and basic public level.

The impact of the new technologies, on my industry, and therefore, the impact on copyright, has been very immediate and very far-reaching. My job didn't exist four years ago. We had a time when motion pictures went from the theater to network television to syndication, and that was it. In the past four years, we have inserted in between there, home video, pay per view, subscription pay television, and, in many cases, those now are larger revenue markets than some of the older ones were.

The price for that has been a reduction in revenue coming in from some of the old markets, such as network television, which no longer consumes motion picture product in the same way it did in the past.

Our sequence right now is theatrical, non-theatrical, which includes such things as the exhibition which takes place here in this hotel this evening, where you'll see them exhibited for public performance and I trust those are licensed performances. [Laughter.]

Home video, which comes before any of the exhibition modes of electronics, because if you don't do it first it gets copied off the air and pirated and the home video market creates itself. That's videocassettes and videodisks. Per per view follows very closely. Subscription pay television follows about six months to a year later. It then goes to network television, then back to subscription pay television, because of its enormous appetite for product, and then into syndication, probably back to pay television once again, because many, many motion pictures are needed to keep 24 hour services occupied.

That's the impact, simply in the direction of our distribution.

The recoupment of investment for video products, film or tape today, requires that all those markets be there also. This is not newfound money. Costs are up, primarily because one, labor. We have a lot of organized labor organizations that get increases and it takes a lot of people to make a movie, and it's still somewhat an alchemy. You don't know when you start whether the cake's going to be good when it comes out of the oven or not.

One of the other primary reasons for increases in cost is the fact that it's so much harder to get people's attention today, because of the proliferation of media. It's hard to get their attention, hard to market. So marketing costs have gone up extraordinarily, just to get the people's attention to come see a motion picture.

So it is very important that we have the ability to recoup our investment from each of these markets, old and new.

Key future issues that I would like to focus on just for a moment. One is I think we have to be very careful that whatever fair use is today does not move over into an area of public performance. And this hotel, I think, is a perfect example of what I'm describing. If you walk by the disco, you see a big ad there for big screen television: come in and watch the videos. On your little social calendar, it says you can watch "Victor, Victoria" in the movie room. Well, those are very close together and it's a very easy move to say "Why are we licensing those movies to be shown our guests, when we

could just run them on that videotape player there on the disco and play them back there?"

I don't think anybody questions that there is a difference between private consumption and public performance, but it gets real shady these days when you look at bars, hotels, restaurants, so-called preview rooms, that are really public performance and copyrighted material must be compensated for that exhibition.

Secondly, I would focus on the international copyright problem. Film and tape are one of the most valuable export products, I think that we have in this country. We have a very favorable balance of trade with that product. And when we start looking down the future with the satellite signal stealing, the home video pirates, and the public performance abuses that take place internationally, that very valuable balance of trade could easily be thwarted, because we don't receive the compensation back from it.

And as my final point, I would stress again and as I listened—I wasn't here yesterday, but today, to the discussions of computer software and libraries, all of which are very, very important issues. It is easy to get caught up in the jargon and in the software and in the gadgets—software nomenclature and gadgets. But the point is intellectual property is property and is subject to the same abuses as any other form of property. Some of the exchanges made this morning made me want to restate this again.

Theft is morally wrong, whether or not you can prove that you had a specific damage at the time that the property was stolen from you.

And severe punishment, or the threat of severe punishment, makes administration or policy of those kinds of laws fairly easy. When we finally got a good piracy law in this country, with the President signing it, it helped a great deal. People police themselves when they know there's a real threat.

And piracy, more properly, stealing, as was pointed out this morning, does do economic harm. It's hard to demonstrate many times because piracy occurs on the best products, not on the worst product. They don't want to pirate my bad movies. They want to pirate my good movies. And the good movies are usually in profit, so it's easy to point and say, "Well, you've already made your money somewhere else. What difference does that little bit that's being pirated off there matter?"

Well, the fact is that the profitable products are what subsidize the unprofitable products, and any time the thief can steal any of the profits, it reduces the ability of the creator to keep on creating. It's like a story I've heard of a gentleman driving down a country road and sees a pig with a wooden leg hobbling in the farmer's field. And he stops to ask farmer the question, he says, "Why does this pig have a wooden leg?" The farmer said, "Oh, that's my favorite pig. He's a wonderful pig. Last winter, he saved my wife and myself from a fire. He came in and woke us up." He said, "Okay, but what about the wooden leg?" He said, "Well, he's really a wonderful pig. My tractor turned over me last spring and I was trapped underneath it and the pig came and dug me out and I was saved. I really love that pig."

Once again, he asked, "Well, what about the wooden leg?" He said, "Well, gee, if you had a wonderful pig like that, would you eat him all at once?" [Laughter.]

And the point is that I don't want to be looked upon as a pig. [Laughter.]

But if we get eaten a little bit at a time, it does make it a lot harder for us to run.

Thank you.

Mr. ZUCKMAN. Our next speaker is Gustave Hauser. He is Chairman of Hauser Communications, an investment and operating company in cable television and other—and engaged in other electronic communications operations. He is Vice Chairman and will be the next Chairman of the National Cable Television Association. For ten years, he was chairman of Warner Am Cable Communications, and is a founder of Orion Satellite Corporation, in which he is also an investor and director.

Mr. Hauser.

Mr. HAUSER. Thank you very much. In the relatively few minutes which we have available here, I would like to address myself to some perspectives on cable and satellites which, in tandem, constitute the major new development in the distribution of information or intellectual property. These distribution techniques along with telephone lines, are involved in all of the issues which were raised here yesterday and today, as we leave the traditional, physical embodiments of intellectual property, such as print and movies, and move to electronics versions of intellectual property, some of which are totally new.

Through cable and satellites we are capable of delivering information electronically to an ever-changing universe of new terminal devices. These terminal devices enable the recipient to store, and/or manipulate what he has received electronically. The problem is one of the control of the receipt and the usage of this information by individuals who have terminals that are really not passive. The TV set was passive. But terminals currently in use are truly active, with features which permit information to be delivered for a limited purpose or time to a particular recipient. At issue is the way in which this limited purpose can be policed or enforced.

I thought I'd take a crack at the word "downloading," which has been so frequently discussed at this conference. Downloading is a word recently created to describe some old things and some new things. It is the electronic delivery of information to an intended recipient for an intended purpose (which may, of course, be perverted).

It is an alternative to the traditional method of delivering intellectual property in a physical form, such as a book. We may now send it through a wire or over the air. Broadcasting is the downloading, electronically, of programs intended for everybody. But it is possible to be more selective. Cable and satellites are continuously downloading material, including movies, computer software, or games, which people may use and manipulate in their home. And we're sending this material not to the public in general but to paying customers in particular, and for a limited purpose.

The law has sought to promote the widespread dissemination of information while protecting the copyright owners' right to obtain

compensation. But the practical basis for accomplishing these goals has shifted with technological developments in our industry, and we are suffering greatly from signal theft and, of course, from the copying of program material.

I suggest that particular attention be given to signal theft, particularly, because our industry is attempting to obtain legislation at the local level making this a crime. We are trying to make the public aware that it is a serious problem, that they are taking somebody's property. The number of people stealing signals from cable and satellites is vast, and amongst the general public, in our culture, it is not regarded as a serious misdemeanor, or any kind of crime at all.

However, I believe that what is today a problem of policing rights may actually be resolved at some future time by further technological developments. Senator Mathias has said that our ability to maintain the principle of copyright may be in question. I don't really believe that we're facing such a cataclysmic question. We're at an interim step in technology; one that still permits thievery and copying and we're evolving to something else, if we can only wait for it. What we have done in the meantime is actually quite ingenious, in my opinion. We have managed to provide compensation and to permit the public to have access to material which they deserve to have.

At a certain technological level of mass media distribution, the issuance of compulsory and blanket licenses appeared to be a way to strike a balance between the constitutional mandate to encourage the widespread dissemination of inf mation and the right of copyright holders to be paid.

These licenses have been widely used, where it is possible to control the disseminator or, what was called last night, the bottleneck. Payment is obtained from the person or company distributing the information, such as a cable operator. But the problem has shifted to the home, and we cannot adequately police any blanket license or privileged use for which a payment is to be received, because we cannot control or limit what goes on in the home.

Consideration is, therefore, being given to a tax on the sale of terminals or equipment that make copying or theft possible. A tax on the VCR or a tax on tape. But as the technology develops, I think these alternatives will be supplemented by other options which will permit a very reliable segmentation of uses and the collection of money on an individual basis. We are already evolving from an era based on the technology of mass distribution to a progressive ability to segment and to monitor individual uses of programming. And we will then have the ability to distinguish between types of use, quantity of use, the amount of time, and to differentiate fees on the basis of the quality of the program.

Already, we've seen such developments in the telephone business, where computers permit phone calls to be charged to individual users, and in offices, even Xerox machine usage may be monitored and charged to an individual client. Similar developments are occurring in cable and satellite distributions.

Cable at first obtained a license to retransmit off-air television signals intended for the public. This, in effect was a compulsory li-

cense. At the same time cable accepted a duty to carry local and network (the must-carry rules).

When cable began carrying "distant" TV signals, a compulsory copyright license was issued and a fee charged to cable operators, the level of which was to be periodically reviewed by a copyright tribunal. This assured the widespread availability of programs to the public. However, this purpose has been constantly threatened, or even thwarted, by the rulings of the Copyright Tribunal making distant signal carriage prohibitively expensive.

With the advent of subscription pay television in the late 70s, cable began installing additional technology to secure individual channels of programming and to limit the availability of "pay" programming to specific subscribers. Then cable offered pay per view services and something which is very important, called addressability. Widespread addressability is now being installed in the cable industry. This provides a capability to address specific programs, whether audio or visual, to specific intended users and to secure it at the subscriber's premises. Addressable pay per view services represent very great horizons for the cable industry, and the technology is also useful for direct broadcast satellites, and other delivery systems.

In short, we are evolving into a very much more sophisticated era driven by technology, cultural acceptance and marketing in which a la carte and on-demand programming, rather than mass media distribution, will be widely available.

The problem of copying, even by intended users of information, will probably get worse before it gets better. But we are clearly on a technological track which will permit us to secure information however presented. Patience is required, and I believe that any hasty legislative solutions which freeze the status quo or attempt to anticipate technological developments are dangerous and threaten to strangle the technological ferment and developments which have caused us to be here today.

Thank you.

Mr. ZUCKMAN. The next speaker is William Lilley, III. He is Vice President for Corporate Affairs of CBS, Incorporated and is the co-author of *New Technologies Affecting Broadcasting.* Before coming to CBS, he worked as a vice president for governmental affairs for the American Express Company, and before that, he served in several high level positions with the federal government, including minority staff director for the House Committee on the Budget, Director of the Council on Wage and Price Stability, and Deputy Assistant Secretary of then Housing and Urban Development.

In an earlier period, he was a professor of government at the University of Virginia and an assistant professor of history at Yale.

Mr. Lilley.

Mr. LILLEY. Thank you. Glad to be here and I've worked in different government jobs and I cannot remember two committees of Congress being so serious about an issue that they went on a retreat and shut the doors and took a look at it. Maybe it's happened; I just didn't know about it.

What I thought I would do, maybe it's the only thing I know how to do, but what I thought might be helpful would be to try to tell you how at CBS, from a business planning point of view, looking

forward to what investments we ought to be making and what investments we ought to be getting out of, and what investments we think our competitors will get into and out of in the future, that I might approach the relevant copyright problems from that point and tell you how he have tried to make our investment decisions regarding your problems.

I'd like to first talk about the big change that has occurred in all the businesses sitting at this table. CBS is probably more emblematic of them than most companies; CBS is the biggest broadcaster in the country, we're the biggest recorded music creator and distributor, the fifth biggest publisher in the country and the fifth biggest manufacturer of toys and games. We've started a major motion picture studio with Time, Inc. and Columbia and we have the largest home video company, CBS-Fox Home Video. In terms of market share, CBS-Fox is just ahead of Mel Harris' Paramount Home Video. So we are in all of the markets that are being discussed today.

If you look at these businesses, the change that has swept these businesses is really only about eight years of standing and I just can't resist telling you the degree of change. If you look back on all of those businesses, less than ten years ago they were characterized by four things that are very important to the copyright issue: stability, scarcity, solvency and market segmentation. All four of those things, stability, scarcity, solvency, segmentation—every one of those four—is gone now. Whether it's by technological change, business entry or government deregulation all kinds of business entry and business exit are characterized. You've got tremendous growth opportunities that have occurred. HBO did not go on satellite until 1976. It has now been more profitable than the NBC television network for each of the last three years and will be this year. Diversity. Abundance. But, most of all, volatility, instability.

And, across these, that whole big change focus, two things have emerged that did not exist before with which we now have to deal; one is project substitutability, the key thing for a businessman. The other is distributional substitutability.

Now, if you think of those two things and the range of interests represented here at this table, whether it's news, entertainment; whether it's series or movies, entertainment, sports, music, magazines, books, toys and games, these are now characterized by product substitutability as well as distributional substitutability.

For the consumer, which is what you people should be worrying about, this is basically a terrific environment because it offers the consumer all kinds of choices that he or she did not have before; you now have an unsegmented multi-media marketplace where the consumer can move in and out at various points where he or she wishes to intersect. There are pricing points, obviously, and all kinds of things that might force them in or out, whether it's free television versus pay television, videocassette rental versus sale, but you basically have an environment which is favorable to the consumer.

What you should not worry about unless you've caused it inadvertently is that there will be an increasing rate of business failure, and you're talking about media businesses and the media loves the media. The media loves the media more than they love the

Senate or the House or the President. See, they love to write about themselves. Ted Turner announces a new business that employs 50 people and it's on the front page of every newspaper in the country. Citicorp rolls out a new line of business with God knows how many people and it is on page 47. In sum, the attention that new business and business failure get in the media, and I include in that the entertainment world, is enormous. And you should not be worried about people saying that because they will fail, you should make some adjustment, and I'll explain that in a minute.

Examples of risk failure are just starting to emerge and you're going to see bigger ones. CBS had one of the first early ones. We had a cultural cable operation we started. It failed. It was $30 million lost. This year, Time lost $50 million, I believe, on a magazine that was going to marry publishing, computers, and cables, and the cable industry, and that has died. Also, this year, Time closed a $25 million effort in Teletext. The newspaper in your own city of Washington last year pulled the plug on a narrow sports magazine and has now bought a sports pay channel.

The biggest risk potential failure will be this year with RCA and the videodisk. This is clearly the last year of trial. The company has put $400 million into this effort. It is the largest, new, high-technology, new effort by a company in the last 10 years, and this is the trial year.

Now, in terms of taking this very different business environment, with people who spend a lot of time lobbying you people, what we think at CBS is that the government, in terms of copyright, ought to have three goals because you've got a copyright world that reflected scarcity, solvency, stability, and the kinds of things of eight or ten years ago. And you had the creative and business elements interacting. Basically, it was a fairly stable world, and things really have not gone awry or become problematic until the last five or six years.

What we think, in terms of the best things to do are that you ought to have a regulatory structure that will allow companies to price their products as close as possible to marginal cost. Doing so would be clearly pro-consumer, for it encourages greater consumer acquisition of product. Clearly, you shouldn't have a copyright strategy which undercuts the incentives to price as closely to cost as possible. A number of examples where that happens have already been mentioned here: the copyright regulatory regime which encouraged home taping of audio and video products; transborder data flow; simply put, the whole mess with Canada, examples like that. Simply put, you ought to have a copyright structure that tries to encourage innovation.

The best example is the FCC's change, and this is sort of like a copyright change, in how distributors were allowed to go up on transponders on satellites. In the past, transponder usage was tariffed. It used to be a tariff kind of process. In the last year, the FCC has gone to an auction process, basically a marketplace process. As a result, you've got ten times more satellites up and fifty times more service by transponders.

Now, that kind of approach serves us at CBS best, because then we can make a rational decision about pricing, or entry, or whatever. What you don't want to get is a copyright regulatory struc-

ture where the regulatory lags create, because of their disincentives, a vested interest which then groups around the regulatory disincentive, an interest which would be disadvantaged if the regulation was made for competitive. And the classic situation there is the taping of audio records which isn't terminally serious yet, because you don't have record rental in the U.S. like in Japan, but has become serious in the whole videotaping first sale struggle. Disincentives like those disadvantage companies from expanding new investment in additional products and hence are disadvantageous to the consumer.

Finally, I want to reiterate the point about international problems. The head of our company, Tom Wyman, is a member of the United States Trade Representatives' Advisory Board; as such, he represents the communications, entertainment, advertising, publishing industries. We have interviewed 55 heads of companies in those areas, the biggest companies. Their biggest problem in terms of the whole trade services issue, they tell us, is the failure for both existing products, and more importantly, for new products that they want to bring on line, is the failure to get internationally adequate copyright protection.

Thank you.

Mr. ZUCKMAN. Thank you, Bill. We'll have more time to talk about the international problems during the cross-discussion.

Our last speaker is Clyde Washburn, who is chief scientist of Earth Terminals, Incorporated, a manufacturer of satellite telecommunication reception products, based in Cincinnati. He's serving his third term as elected Director of SPACE, the Society for Private and Commercial Earth Stations, and is also a Governor of the Television Viewing Rights Superfund, organized by SPACE. He has served as technical liaison to government agencies and satellite program suppliers.

Mr. Washburn.

Mr. WASHBURN. Thank you. When I was asked to participate and prognosticate a bit, my first thought was one of our board members in SPACE is Professor Taylor Howard, from Stanford, who was asked in, I guess, the late 50s, to predict the future of electronics for SPACE. And at the time, the best that they could muster up was a prediction of very small vacuum tubes. [Laughter.]

So, realizing our limits at looking into the future, I'll try.

One of the major things that we see going on is the shift toward digital formats for most entertainment products, just now starting with music, with the laser disk, and also video, and of course, teletext and things of that sort. What's so significant about that is that once you have fairly widespread digital formats, you have the ability to sell and distribute a wide variety of what you might call background services. Once you've digitized information, you can transmit it at any data rate that you can conveniently handle, so that, as an example, you can subscribe to a record of the month club that might come in via your cable, and quietly, while you're watching cable, over a period of perhaps a day, accumulate a record's worth of digital audio information which could then be played back as normal audio. So this door is opening, as all of the formats are going to a digital format.

Cable and DBS are going to be the biggest players in that, from our perspective, because, basically, if you're going to send a lot of services, you'd like to have a lot of bandwidth. The premier contender is satellite distribution in general, and DBS, Direct Broadcast Satellite, because there is quite a bit more bandwidth available than almost any other medium.

When we think about these services being—this type of service being distributed, and the ones that we presently have, the first issue that came to mind is one that Fred Weingarten touched on this morning. We have a notion in this country of universal service for things like telephone and broadcast and newspaper. The idea that basically anybody that has the price and the interest should usually have access to copyrighted material. Unfortunately, we seem to be losing that with some of the new means of communications and we're developing a problem of what you might call a two-class society, of the urban and the suburban, that have access to cable and other forms of mass media—modern mass media distribution, and the rural, or economically uncableable American family, who basically isn't being touched by any of these things. And our telephone system is capable of only such very low rates of data handling that it really doesn't significantly—it isn't a significant portal to the household for new information services.

DBS, Direct Broadcast Satellite, that we read so much about is not going to be a full solution and there's a number of problems that I could tick off. One is, of course, that it's not in place yet. And what we read most recently tends to be in the nature of small and large setbacks for the schedules that everybody had originally envisioned.

There's a very high start-up cost involved, because it's a whole new technology, and that's going to tend to limit the number of services that can afford to get involved at this point and, therefore, the number of services that can be distributed in that manner.

For the rural American, there's a technical problem that isn't too widely appreciated, and that is the direct broadcast satellite service tends to be bothered by rain. Perhaps not so much of a problem if you're watching a television broadcast, a video broadcast, but if you're using it like a high speed data line, like a dedicated telephone line to, as an example, bring commodity quotations into your farm for the business end of our agribusiness activities, that lack of reliability isn't really fully addressed.

And other problems of initially limited programming and the apparent inability of many of the participants to get together on some sort of format standardization, technical format standardization.

What's interesting is that while all this is going on, there's a parallel system in place right now, and that is four gigahertz satellite reception. There's been a few references earlier to it; unfortunately, usually in the context of piracy, but what's interesting is that we're talking, for the copyright holder, about a lot of money that's sitting on the table yet. The trade association that I'm on the board of has a standing offer of over three years duration to do whatever is necessary to make the financial connection between the people that hold the copyright on the entertainment material and the

people in rural America who have satellite television as their only means of getting the programming.

We have made every other overture we can think of, one of which is offering to serve as a clearinghouse for standardized program encryption, good MIL spec, you might say, high grade, modern encryption that can guarantee the integrity of the program material and can solve problems like local blackouts for sporting events. We're quite sensitive to all of those issues, and would be happy to technically coordinate them.

I'd also mention the Caribbean problem, where American satellite communications and entertainment is being intercepted without authorization. We as an industry are sensitive to that, and are very happy to help the copyright owners close the gate. Everybody, I think, knows deep down in their heart that there won't be quality programming to watch unless the people who make it get paid for doing it!

So we do wince a little bit at the references to piracy. There's a lot of the Dakotas out there. There's a lot of people in this country a hundred miles from the movie theater. We're really asking them to live in a very unmodern fashion unless we can address this issue.

Thank you.

PANEL DISCUSSION AND QUESTIONS

Mr. ZUCKMAN. Two of the panelists touched upon some of the international problems of interception of satellite transmissions, and I wonder if we could start in the 15 minutes or so we have for cross-panel discussion with some further commentary on the international problems, which will hopefully be of interest to members of Congress and their staff.

Bill Lilley, I wonder if you would pursue just briefly that problem you finished up with.

Mr. LILLEY. The problem is enormously interesting from an academic or analytical point of view. Companies in the communications business, the entertainment business, the publishing business, and the advertising business are beginning to have serious problems abroad because other countries have neither our freedoms nor our copyright protection—whether it is unauthorized distribution of ET videocassettes before ET was on videocassette in the United States—apparently, they sold over a hundred million of them in Great Britain. The problem is exacerbated in almost every country because we have such different laws and constitutional protections governing the way we—whether it's news or even entertainment programming—is delivered. Also, in many countries and I include most European countries, many of these businesses are run by and often owned by the government. So that the range of problems, such as the stripping of advertising, or restrictions as in Germany where children can't be used in advertising. The problem is two fold. There is no American-type protection for the old kinds, the segmented businesses that I talked about first; exacerbating the problem is the lack of protection for the new businesses that represent merges of types of technologies and products. Very few countries have copyright type laws governing new technologies, witness

the Caribbean Basin where HBO signal is routinely lifted "legally" without compensation, I guess Jamaica is the worst example.

What more I can say except it is a very serious problem. The one effort that Congress made, with Canada, to try to remedy the situation has become more inflamed because we retaliated on the tax side, and they retaliated by toughening up their law, and it's a very serious problem and will begin to affect—I mean, Mel Harris had a very good example, that the things that are being stolen or somehow deflected or diverted or drained are the things on which we make a lot of money. They're not stealing the things which are the dogs. It is hard to prove the harm, but it will become an increasingly serious problem. It is already a serious problem. Those four industries, we don't work together usually, we're not good at dealing with government, and that exacerbates the problem further, and usually we're fighting with each other before we go to the government.

Mr. ZUCKMAN. Anyone in the panel have any other comments about the international situation before we move on? Yes, Gus?

Mr. HAUSER. Yes, just a brief comment that as cable and satellite developments move forward overseas, particularly in Europe, I think there'll be a greater and greater appetite for American programming, which will get over there somehow, and possibly the theft problem will be even increased on that basis.

I was thinking, though, of programming coming inward from foreign locations. We have the ability now, not only to present a lot of programming that never otherwise would appear in this country, because of channel capacity, but also to provide separate audio tracks behind video programming simultaneously so that, for example, you could show a French motion picture with three different language dubbings—English, Spanish, and whatever the audience that's watching it. I'm not a copyright expert and I don't know what the rules are about manipulating the information that has been received here by a cable operator and in effect putting—inserting another language track, but it would be certainly advantageous to do that.

Mr. ZUCKMAN. Clyde, did you have a comment?

Mr. WASHBURN. Yes, I think manufacturers would tend to see the problem as a failure to monitor technology. I'd liken it to the deliberations of the Federal Reserve Board being broadcast in the AM broadcast band and then noticing that there was a problem that people were eavesdropping. The technology of reception has become so commonplace, and I think the technology of control was developing alongside, but we were very late in recognizing the need for the control.

Mr. ZUCKMAN. Fine. All right.

PANELIST. If I could add just one thing, and this is a real dozer, bureaucratically, but one of the problems that really makes this international situation worse is that there is no home for it in the government. It is divided between the State Department, which has different interests; the Federal Communications Commission; and the USTR; the Commerce Department. There's an office in the White House that fools around with it. And I don't know—I guess there's a lot of congressional committees that are involved in it,

but the thing is just all over the place, and nobody really focuses on it.

Mr. ZUCKMAN. Yes, Mel.

Mr. HARRIS. I just want to reinforce the point that more and more of our exports are going to be copyrighted material instead of wheat, beef, automobiles. And the jobs that that provides in this country are going to increase sizably, and that's why I think this focus beyond just the immediate thing is a good long-range one in terms of our long-range economic interests as a trading partner in the world, because we haven't been particularly good at making money off of the new technologies yet. Somebody else has been doing that, and now money's been going to different countries for it.

Mr. ZUCKMAN. All right, thank you. One of the panelists touched upon the problem of lateness in reacting to some of the development of user interests and some of the new technologies, and it has been alluded to throughout this symposium. And so, I'm wondering what the panel's reaction is to this: given that legislative and judicial solutions to copyright problems created by these new mass technologies may not be sought until after user interests are created, do you have any suggestions for the Congress, for the Copyright Office, on monitoring these developments and perhaps getting ahead of some of these problems before they become problems. Anyone care to comment on that? Yes.

PANELIST. I'm glad you used the word "monitor," instead of "legislate." One of the things that I think has characterized the development of law in this country is that it is reactive, and tends unnecessarily to follow what is rather than hypothetically what may happen. It's very difficult to predict the future and to legislate about things that have yet to be developed, and the risks of really terminating all development or, in effect, freezing things into a mold are very great.

I think the developments that we're talking about here at this conference are largely due to a system that has permitted a totally free development process without—essentially without serious restrictions on the ability of people to innovate and take chances and try new things, step on somebody's toe, but nevertheless, it's all worked itself out in time, so my thought is please don't overreact. Have patience. Monitor. But let some of these things correct themselves.

Mr. ZUCKMAN. Would you agree, then, with Bill Lilley about not being too concerned about the failure—or even substantial failures in the marketplace of some of these companies dealing with new technologies and new delivery systems?

PANELIST. Well, the so-called failures in the marketplace are normal to every kind of industry and I don't think that's a matter of concern to anyone except those who failed. It's their money, and if they were foolish enough to invest it and make a mistake, there's no way the government or any legislative process is going to protect them.

Mr. ZUCKMAN. Yes, Bill?

Mr. LILLEY. I'm distressed that Gus thought what I had said was an encouragement for the laissez-faire approach on the part of Congress or the Copyright Office. I think that, perhaps it's my training

in economics, but I think that one of the jobs that you have to do is that you have to realize that the kinds of apparatus that copyright represents is regulatory apparatus, and no less powerful than the most powerful EPA rules, or OSHA rules, or Federal Reserve rules, and it is well known—gosh knows, we've heard all about it in the 70s, how regulations drive up costs, and I think it is imperative that people that are charged with being responsible for copyrights see it as a regulation of some kind. And that it be administered with a sensitivity to its cost and pricing impacts that it's having, particularly because you want to have a regulatory structure that is pro-consumer, and you've got to be sensitive to that.

I, coming down on the plane here, read the Senate Committee report on the audiotaping bill, and I'm reading along and at the end there is this blithe one-sentence impact submitted by CBO, saying that this bill has no regulatory/inflationary impact. We all know the law that was put in and nobody really pays attention to it, but of course it's going to have real impact. It's probably going to be salutary, but it shouldn't just be an afterthought. That should be a very important part of your business.

Mr. ZUCKMAN. Yes, all right. Clyde, and then . . . Mr. Berman?

Mr. BERMAN. Yes, I had one question for Mr. Hauser. I think—I'm concerned about, first of all, no one's answered my question, which I think is on the minds of some about whether we need new copyright protection. That's an injury question, or the incentive question.

But then, on the other hand, let's presume you do and the question is what kind of scheme do you put in to protect copyright with the new technology? One is the technical solution. That was discussed this morning and no one seemed to think that in the near term that technical solutions are possible.

The other is a licensing scheme which raises price questions for the consumer. It's going to cost more for a lot of buyers.

But then Mr. Hauser was getting to another set of controls, which he called monitoring. Segmentation of uses. You were saying that some of the problems to be worked out, and I'd like you to elaborate—is that to keep track of each use that a consumer makes of his television set or his audio equipment or his cable or his telephone or his computer, so that you can bill that person? But you would also be maintaining a record of every one of their transactions?

Mr. HAUSER. Yes, we were talking, I think, about monitoring in a legislative sense, developments in the copyright field. You're addressing yourself back to the technical question of how individual use of program material can be quote, "monitored," which is just a way of describing keeping track of usage and, therefore, charges made on a per program or per use basis. And there are technical developments that we probably don't have time to get into that are very encouraging, and some of them were discussed last night, involving the self-destruction of material after a period of time, the use of particular decoders. We've come a long way already in the cable related business in terms of traps and addressable—computer-addressable equipment that permits this kind of billing so at the end of the month you would send the consumer a bill, just like the telephone company does for long distance.

Mr. BERMAN. Let me just make my comment first, for the ACLU, which is that in this area we're really concerned about the privacy question that are raised if a policing mechanism which is going to police the individual user and their uses of this technology across a range of media uses, banking transactions, shopping. You're putting together the potential for really computerizing and recording total life transactions of people.

PANELIST. We have to be very sensitive to, and I believe everyone is. It's not a new subject, but I don't think there's necessarily any invasion of any personal privacy on an involuntary basis.

Mr. ZUCKMAN. See, we have the interaction beginning with the audience, and at this point I want to entertain questions and comments from members of Congress and their staffs. Senator Mathias?

Senator MATHIAS. The question of timing has arisen in this panel and I think that's an important question for the Congress. We could obviously act too soon, and act on the basis of insufficient knowledge, insufficient experience. On the other hand we might wait so long that it becomes really politically imposible to do very much. Take the Betamax case. It's, I suspect, marginally possible to do anything about the Betamax with ten million machines operating in the United States; when there are 50 million that will become much more difficult. Now, what is the time frame? Should it be a graduated scale for different elements of this whole technology, or is there some point at which the problem becomes so massive that there really can't be anything done?

Mr. ZUCKMAN. Mr. Washburn?

Mr. WASHBURN. Yeah, I'd like to comment on this one, especially because we have a lot of what you might call software people represented, but I would like to take the perspective of the hardware manufacturer. I think it's maybe more important for the hardware manufacturers to see regulation of problems occur, if possible, ahead of the fact or at least not long after. And the simple reason is that we deal with physical inventory. We can have millions of dollars worth of hardware that is suddenly unsaleable because some problem was recognized that the hardware contributed to.

In the case of the software vendor, the legislation tends to improve his revenue recovery. Particularly from the point of view from our industry, it's enormously important, because it's one of the few areas of electronics that is American dominated today, and it would be hurting almost exclusively our own not to legislate early enough to get orderly compliance.

PANELIST. I think the tragedy, Senator Mathias, is that what's good for the hardware industry is probably—and for the people that work for it, or are employed by it—not good for the software companies or for the consumers that buy the software. What really drives all of these businesses is not the hardware, but it's the software that they get. And that's what the people really buy.

We've done all kinds of surveys, CBS, and people don't know the difference between cable, pay cable, network television, independent stations—they all think they're watching something called television, and they acquire the products. And we have seen—pay television in this country, we have the worst television service, 525 lines, even the British and the French have much better television

because they don't have the rigid standards that were put in early in this country, 1953 standards, around which the whole industry grouped and built terrifically cheap sets. But you depress the level of quality, and I think you want to act later, rather than earlier, to let the people—to get that software on line because that's what the people are going to buy.

And in that regard, I would mention that you would want to monitor for these kinds of price enhancement or sort of dislocation effects that when you begin to have a regulation in one area of the copyright affecting either a new product or an old product, that becomes harmful to the consumer for either of those reasons, I think then you've got empirical evidence that that regime should be adjusted in some way. Not for the software or the hardware persons, but for the person who's trying to acquire the product. I think that—the split between the pricing in the sale and rental of videocassettes is the kind of thing, and if you read your report on the audiotaping, you say that it is a very good thing to pass the audiotaping bill now, because with the compact disk coming on line this year, which is going to cost $20.00, which can be played indefinitely, millions of times, without any impairment in quality or sound, that you would have a record rental business springing up like that. So you adjust it fast there, but you've got really already the same distortions that you're guarding against in the videc field.

Mr. ZUCKMAN. Mel, did you have a comment?

Mr. HARRIS. In terms of timing, I think that I will agree with Mr. Lilley that some things are going to have to be dealt with as they occur or expose themself broadly enough to need to be dealt with. But I am concerned that in that waiting period, there not be a reinforcement with the American public that copyright is a property right and it is stylish in America today to steal cable television signals. Gus will tell you. It may be as high as 30 percent in New York City, by itself. Between 15 and 20 percent of the homes do that now, and it's almost stylish. "You mean you're paying? Well, fool, why are you doing that?" And I don't think that if we let that kind of attitude become pervasive that we'll have much success with whatever we choose to do on future issues that are more segmented, finite, and perhaps even special interest serving.

Mr. ZUCKMAN. I'd like for other members of Congress and their staffs—Congressman?

RESPONSE FROM AUDIENCE. Yes, I might say that I'm very sympathetic with Congress, you know, not rushing into something, but the Betamax case is very much an exception. Up till then, the Federal courts rush in if we haven't acted and then, with our natural disinclination to get involved with controversial things we don't have to get involved in, we let the court legislate. So I just think we can't—there's a fine balance between how long we can wait before the Federal courts activistically view this as an area in which Congress has not acted so they legislate.

Mr. ZUCKMAN. Anyone like to respond to that comment?

RESPONSE FROM AUDIENCE. Yes. Yes, this is a matrix of problems. I was suggesting that perhaps no wholesale approach to copyright be taken at this point to change what is, without knowing what's coming. Yes, the courts may step in, that's a peril. But the perils of moving in and doing something wrong are equally great. There are

certain things, perhaps, as a factual basis that need attention: signal piracy on cable. We're asking for legislation; we're getting it in state legislation, largely.

You might well ask yourself whether home video, VCRs, would exist today if legislation had been enacted years ago in some direction. Maybe this industry would never have happened. You never know if you're right. You may do something and perhaps even in the question of audiotaping, and whether or not a rental business will spring up. We don't know. And, perhaps, we would stifle some business by acting in some direction now, with the future unknown. So there's really no answer, except to be cautious.

Mr. ZUCKMAN. Are there any other questions or comments from members of Congress or their staff? Yes, sir? Would you identify yourself, please?

Mr. PODESTA. Yes. I'm John Podesta from the Senate Judiciary Committee. I want to address a question to Mr. Lilley on the international copyright issues. You mentioned the fact of retaliation against Canada and suggested that that was a counterproductive strategy, although I don't think there's actually been any retaliation in either the tax or copyright policy. There's been a suggestion of it, but——

Mr. LILLEY. Well, I'm sure all the Congressmen know about the convention tax change that we put in, what was it, four or five years ago? Where we disallowed the number of conventions that you could go to and have tax deductible per year in North America. It's down to one convention now and it used to be unlimited. Apparently it was very damaging to the Canadian tourist business from here. That's what they say.

Mr. PODESTA. That doesn't seem to have worked. You talk about Jamaica. We've tried the Caribbean Basin Initiative. That seems to be potentially more successful. And you also described the problem of separation of authority between the—amongst the various agencies of the federal government, and that no one has the lead on these issues. Do you suggest the Congressional role that you think ought to be, in trying to hold this together and focusing attention on the growing problem which you describe as being at the forefront of the minds of 55 corporate executives that you dealt with.

Mr. LILLEY. Well, let me give you the good news and the bad news. The good news is that I think that the problem that we've just—that all of us alluded to briefly here at the end—is one of the most politically glamorous, politically sexy, interesting, because it's about parts of the media, the media is very caught up in it, it's very pro-American, it is one of the areas where we are clearly the world leader and have been ever since—because we do things, because of the First Amendment and everything that other countries don't do, and this is one of the things this country is just passionately supportive of. Consumers consume these products, they're intensely proud of them, so it should be an area ripe for political leadership. There isn't a visible down side, because everyone is proud of these things and the Europeans and the South Americans want to consume them, even the communist countries want to consume these services or products. That's the good news.

The bad news is that the companies that make these products or distribute these products ususally spend most of our time fighting amongst ourselves in your offices. That's problem one.

The second problem is that historically, the executive branch is badly divided over this thing, and the State Department, which has the lead, has another agenda, which is usually making the countries feel better about themselves and not worrying about getting these products distributed.

And I think it is organizationally very difficult—I don't know what committees have responsibility. I guess Finance and Ways and Means have responsibility, but they don't exercise it. They don't have an intellectual interest in it, like your committee has.

So it's a wide open field. You've got these big companies that are employing a lot of people to do these kinds of things, that are trying to distribute them are having problems distributing them, and no one is doing much about it. And you are the people who can do something about it.

Mr. ZUCKMAN. All right, Congressman Sawyer again.

Mr. SAWYER. Yes, I would like to ask Mr. Lilley, I'm not aware of any law that limits the number of conventions somebody can go to. I know there's one that limits it to the western hemisphere, but I'm not aware of any new national limitation. Do you have something specific in mind?

Mr. LILLEY. Bob, tell me if I'm wrong, but isn't that Northern American restriction still in? That if you go on a business convention, Congressman, you can only deduct in North America——

Mr. SAWYER. Well, I've said, within the hemisphere, but not the number.

Mr. LILLEY. Outside the continental—outside the United States, in North America, you can only go business deductible to one convention.

Mr. SAWYER. I'm not aware—I never heard of that before.

Mr. LILLEY. And it was put in to retaliate——

Mr. SAWYER. I learn something every time I come to one of these. [Laughter.]

Mr. ZUCKMAN. Let me open it up. Canadians are very bitter about it, now. We only have a very few minutes left. Congressman Kastenmeier.

Representative KASTENMEIER. I've just got one simple question to ask of Mr. Washburn, who seems to be soliciting both early resolution of his problems; namely, to submit his hardware industry to some form of royalty or some form of agreement if he can get it, but there doesn't seem to be any response on the part of the proprietors.

PANELIST. You noticed that, too? [Laughter.]

REPRESENTATIVE KASTENMEIER. I'm saying that's what you asserted, and that seems rather curious, in a sense. There are a number of legislative proposals on the table, but that's not one of them. I wondered, Mr. Washburn, what the state of affairs was and why proprietors are unwilling to subject direct broadcast satellite systems to copyright—to some form of agreement wherein they can derive royalty.

Mr. WASHBURN. I won't try to explain for them what the reasons are. I can only say that with some certainty, since I've been con-

tinuously on the SPACE Board of Directors since the offer has been open, that we have never received a serious proposition to, you know, accept or reject, and the offer is continuously open.

RESPONSE FROM AUDIENCE. Who do you consider the owners, the proprietors of material, with whom you ought to be dealing?

Mr. WASHBURN. All of the suppliers of—well, let's put it this way. The major suppliers of high-grade entertainment products on satellite, which would include HBO, Movie Channel, Showtime, et cetera.

Mr. ZUCKMAN. Let me just apologize, Congressman Kastenmeier for not recognizing you by your name. But we have time for——

RESPONSE FROM AUDIENCE. But I do believe that's a question that deserves an answer from a product supplier, at least. I think as you phrased the question, there is not a problem. When you say "direct broadcasting satellite," the difficulty that has existed in the near term past has been that these were not direct broadcast satellites; these were intended to be point to point communication vehicles going to head ends of cable systems or to broadcast stations for dissemination when they were received. And the rights for direct broadcast satellites have not been granted to those program entities, the HBOs, the ESBs, and whatever else they were at that time.

Direct broadcast satellite is now here. We have one in operation; yes, it has a rain attenuation problem. That's because it's operating on a low power. There are several other direct broadcast satellites. I don't think that you would find that any product maker or program supplier wants to deny any portion of the American public access to their service, but it is a manner—partly what you said, Gus, and that is, you wait for the right thing to get there to get it to serve them.

Is that any help?

PANELIST. I would make one comment on that, and that is that we understand that the existing providers may not have DBS rights to the product. However, as long as about three and a half, probably four years ago, we were asking the people who are handling it now to resolve that, to request those rights, to let us know what the price was. We appreciate that the chain has to go back to the original creative rights owner, and we would like to do whatever we can to forge the links.

Mr. ZUCKMAN. Prerogative of the last question to one of our hosts, Mr. Ladd.

Mr. LADD. I've decided that I don't understand my own questions, so I yield. [Laughter.]

Mr. ZUCKMAN. One very quick question, and one very quick response. Mr. Abbott?

Mr. ABBOTT. Yes, there's a lot of reference to signal piracy. Well, as you may be aware, there's a proposed satellite convention which the United States may or may not eventually enter into which arguably could solve some of these problems, whereby each potential signal port would agree to protect from piracy the signals of others. Of course, it remains to be seen what will happen there.

Quick question. Mr. Lilley mentioned marginal cost pricing. Of course, marginal cost pricing of videotapes would be the price of copying, so I wasn't exactly sure of that reference. I mean, it may

be socially optimal in some sense, but it's not price—marginal cost pricing.

Mr. LILLEY. No, I must have misspoken. I think that you would want a regulatory structure in place that would foster the kind of marketplace competition that would tend to drive price as close to marginal cost as possible, and not create either an artificial barrier to that downward pressure.

Clearly, when you go below marginal cost, nobody is going to make it.

Mr. ZUCKMAN. Now, I promised the chairman of the next panel that we would vacate as close to the mark as we can, and we're at this point. Let me thank very much the panel today, but also, Mr. Ladd and his staff for persuading these extraordinary gentlemen to come together with us today and give up their weekends away from their homes. I think it's just been extraordinary. [Applause.]

ADMINISTRATION OF RIGHTS

Mr. LEIBOWITZ. As I noted this morning, Judge Breyer began to open the Pandora's box of questions concerning the administration of rights in new technologies. There are various types of administration systems now in operation, from individual licensing, blanket licensing, government intervention, private licensing.

Today's moderator was supposed to be Professor Alan Latman from New York University Law School. Professor Latman, unfortunately, was not able to join us today, and it is a great loss to all of us that he is not here to share his wealth of wisdom with us. There are very large shoes that had to be filled. However, we have our Rapporteur, Professor Goldstein, whose feet are rather large, too, and we hope will be able to try to fill Professor Latman's shoes. [Laughter.]

As you heard in the introduction to Professor Goldstein yesterday morning, he is a professor from Stanford University Law School, a noted educator in the intellectual property law field, and is the author of the textbook "Copyright, Patent, Trademark, and Related State Doctrines." He is also a former winner of the Nathan Burkan (phonetic) competition when he was in law school, and I was fortunate, when I was a law student, to take four different courses with Professor Goldstein, and I am very grateful for the knowledge that he gave to me, and I'm sure that we will have more knowledge to give to all of you.

Professor Goldstein.

Mr. GOLDSTEIN. Thank you, David, that was very kind. The subject of our last panel of this session is the Administration of Rights in Copyrighted Works in the New Technologies. The members of our panel, moving from my immediate left to the distant left, are Thomas C. Brennan, Chairman of the Copyright Royalty Tribunal; Harlan Cleveland, Director of the Hubert H. Humphrey Institute of Public Affairs, University of Minnesota; Alexander Hoffman, Senior Vice President, Doubleday and Company; Professor John Kernochan, Columbia University School of Law; John C. Taylor, III, Chairman of the Carnegie Corporation and a partner in the firm of Paul, Weiss, Rifkind, Wharton and Garrison; and George

Willoughby, Vice President and General Counsel of King Broadcasting.

Let me begin quite briefly by describing what the members of this panel are not going to talk about. They are not going to talk about how, if at all, the information created by the new technologies should be protected. That topic has already been considered in some of the earlier discussions and will not be rehearsed here. Rather, our panelists will address the problems that the new technologies create for copyright owners of all forms of information, both traditional subject matter and new subject matter. Specifically, they will consider problems that the new technologies create for policing the uses of copyrighted works by such undetectable and decentralized as photocopying and performance, to take two of the more traditional examples.

In this context, the central question that the speakers will address is whether the common perception—that the new technologies have rendered copyright in many respects obsolete—is in fact a misperception. Do mechanisms exist, and can mechanisms be created in and out of the marketplace, that can overcome the problem of decentralized uses, both effectively and fairly?

Our first speaker, is Thomas C. Brennan, who is Chairman of the Copyright Royalty Tribunal for a second time, after having served as the first chairman at the inception of the Tribunal in 1977. After earning his J.D. degree at Georgetown University, Mr. Brennan served as Chief Counsel to the Subcommittee of Patents, Trademarks, and Copyright, U.S. Senate Committee on the Judiciary, during the time that the new copyright legislation—the 1976 legislation—was developed. He has served as a member of the Board of Trustees of the Copyright Society and as Chairman of the Committee on Patents of the Administrative Law Section of the ABA.

Tom?

Mr. BRENNAN. The former Register of Copyrights, Barbara Ringer, in a 1977 law review article, posed the following questions. Does our experience in the development of the 1976 Act suggest that in the future whenever a new right is granted by Congress it will necessarily be subject to compulsory licensing? Does this mean that eventually compulsory licensing will supplant traditional copyright and that all rights under a copyright law will, in time, consist entirely of the right to collect royalties?

Miss Ringer continued. "These troubling questions must be asked in the light of another even more portentous development. The Copyright Royalty Tribunal," she wrote, "is in many ways a sensible and ingenious device for making the various compulsory licensing schemes work efficiently. At the same time, the existence of a government body that is paying out royalties, settling disputes among copyright owners, reviewing royalty rates, and deciding the terms and rates of licenses seems an open invitation to further government control. All this bears close watching in the months and years ahead," end of quote.

It might make for a more exciting session, but I do not have any fundamental difference with that portion of Judge Breyer's remarks this morning relating to regulation and government involvement in licensing schemes. Government intervention should not be

seized upon as an easy answer and a convenient solution to dispose of complex problems. But, the more difficult question remains, are there circumstances in which some government role is appropriate as a necessary last resort? And what is to be done with the many details inherent in licensing schemes that neither the Congress nor the courts wish to handle or should be required to handle?

I was surely not invited to take part in this program because of any jurisdiction of the Copyright Royalty Tribunal relating to new technology. I shall limit my remarks to some observations on the Tribunal's experience with the fixing and distribution of copyright royalties in those situations where user industries discharge their copyright obligation by a single payment.

A useful starting point is the relationship between private licensing and collection agencies and the existence of some form of governmental mechanism. Nothing in my Tribunal experience suggests that private agencies cannot assume the dominant role in the administration of rights. Where such private agencies did not exist, the Tribunal in performing its royalty distribution functions under the compulsory licenses, has found it extremely useful, indeed essential, to encourage the creation of ad hoc collective agents. If the Tribunal was not able to coordinate its distribution functions with informal coalitions of program suppliers, sports leagues, and commercial broadcasters, it would have been impossible for the Tribunal to perform its distribution functions within the rigid timetable established in the Copyright Act.

After a period of testing and experimentation, the distribution system is functioning. And now, many matters are routinely processed. While the existence of private agencies has been essential to the viability of the Tribunal's operations, it is also clear that the compulsory licensing scheme could not operate without some form of government mechanism.

For example, sports leagues and commercial television stations have fought for years before the Tribunal over their respective entitlement to that portion of the cable television royalties assigned to the carriage of sporting events. How would a cable operator have been able to confront this issue in the absence of some governmental mechanism? I believe that the most appropriate role of any government function in this area is to be available to resolve rate and distribution matters only when the parties are unable to do so. Through its procedures, the Tribunal has encouraged voluntary agreements. In doing, so, we have built upon the approach taken by the Congress in the public broadcasting compulsory licensing. Any licensing arrangements negotiated by the parties should supercede any rates adopted by the Tribunal or any similar government agency.

Policy makers should take particular care in making decisions concerning the structure and scope and the jurisdiction assigned to a body such as the Tribunal. Perhaps some useful lessons may be gained from the Tribunal experience.

When the Tribunal was created in the Copyright Act, the Senate and House had differing views on the structure of the Tribunal. The Senate bill provided for ad hoc panels that would be established as necessary for particular proceedings. The House bill, which prevailed, provided for a continuity of membership. There

are pluses and minuses to either approach, but I believe in the actual operations of the Tribunal, a hybrid has developed whereby within a formal permanent structure, informal dispute resolution has been encouraged.

During the consideration in the Congress of the establishment of the Tribunal, various user industries were successful in placing certain limitations on the jurisdiction of the Tribunal. The Tribunal's rate jurisdiction has been limited to reviews at five to ten year intervals, with no provision for relief petitions or any possibility of making adjustments to account for significant new developments. Presumably, at the time, such limitations were viewed as helpful to certain industries. I suggest that a case can be made that such limitations have backfired on their proponents.

It is only stating the obvious to declare that policy makers, to some extent, have either not anticipated or have chosen to ignore important technological advances which have impacted greatly on intellectual property rights. It is not sound public policy, on the one hand, to say that the future cannot be predicted and is fluid, and then, on the other hand, to create arbitration or dispute resolution mechanisms that are established in such a fashion as to effectively preclude consideration of developments which are essential to the determination of matters within the assigned jurisdiction.

If such mechanisms are to make a useful contribution it is essential that they have the necessary jurisdiction and be provided with the required resources.

Thank you.

Mr. GOLDSTEIN. Thank you, Tom. Our next speaker is Professor John Kernochan. As I indicated, he's a professor at the Columbia University School of Law. He was Executive Director of the Council for Atomic Age Studies from 1956 to 1959 and a member of the President's Commission on the Status of Women from 1962 to 1963. He presently serves on the Board of Directors of Volunteer Lawyers for the Arts, and he was Chairman of the Board of Galaxy Music Corporation.

Mr. KERNOCHAN. I am.

Mr. GOLDSTEIN. Oh, the information sheet says you were.

Mr. KERNOCHAN. Perhaps it knows something . . . [Laughter.]

My view of copyright concerns is a worm's eye view from the angle of the composer-author-artist with whom I deal constantly, especially in connection with Volunteer Lawyers for the Arts. At VLA, I regularly see and try to cope with the plaint of the individual artists and small arts organizations that can't afford effective legal service. And, in trying to do this and protect the copyright owners' interests, the creators' interests, one sometimes recalls what Mr. Justice Holmes indicated he felt in trying to deal with Mr. Justice MacReynolds: "How are you going to argue with a man whose major premise is always 'Goddamn it.' " [Laughter.]

This is the kind of arguing you run into when you're trying to deal for copyright owners with people who don't understand how intangible rights can exist in something that they hold in their hands.

In any case, I want to offer you a few observations to mull over. Incidentally, I hope that someday soon, and in accordance with

what Ms. Hunter suggested this morning, we can stop talking about copyright in favor of using a broader term, "authors' rights." The Constitution doesn't use the word "copyright." And copyright is coming to be a more and more troublesome word and concept. So maybe authors' rights would be a better label for the whole subject.

I have a number of points to make. Number one, let's look back to first principles in the Constitution at the start, to clarify what we are really after with copyright. Both the Paramount and most recently, the Betamax decision, it seems to me, went astray on this matter, saying that the interest of the artist is secondary to some general and presumably distinct public interest. In my view, that's a license to drive holes in authors' rights under the name of fair use, First Amendment or non-infringement or whatever—whenever there's a loud public clamor for a particular use. I think the cases demonstrate that.

But, most importantly, the Constitution says nothing of that kind. The power given to Congress is a power to promote progress by giving authors rights. It's a power to do X by doing Y, and the only legislative history we have on that provision, written by its originator and proponent, James Madison, says that in this area the public good fully coincides with the claims of individuals—individual authors was what he was talking about.

What is now given authors, generally, is not the fair return for use of their work that David Ladd quite rightly says they should have. On this point, also, I think the Court was deluded in Teleprompter, which was quoted again in the Betamax case, where it was said that "The immediate effect of copyright is to give the author a fair return." All the evidence I'm aware of is that that is a false statement. Now, if you're talking about the aim, okay. That's something else. But the effect, no.

I agree a fair return is a desideratum, and I would suggest as a basis for our thinking that the ultimate goal of authors' rights is of assuring that worthy author whose work appeals to a significant public is decently paid for its use—so he can stand on his feet without dependence on government or patronage. Those of you who were here this morning heard me read the statement of Lord Macaulay where he said pretty much the same thing. We underpay and undervalue our teachers and lose quality in the process. Let's not do the same thing to our authors and, for that matter, let's stop doing it to the teachers.

Point two. I suggest our eyes should be on the creative individual. That's where the Constitution puts the focus. It talks about authors and Madison equates them with individuals. I'm not downgrading collaborative art, made possible by new technology, from movies to TV; but courts, and perhaps Congress, can be misled by the big companies—movie, television, cable, and other factors or parties in the copyright litigation that we read about—who do the most litigating and the most lobbying in Congress. It's easy to forget that the individual, the creative individual, is the key concern. We want more Mark Twains, Walt Whitmans, Aaron Coplands, Cole Porters, and Gary Trudeaus. But we must support many lesser talents to grow the top of the crop, represented by the names I've mentioned. So, for starters, don't give away the rights of authors to everybody who asks for them, form veterans to frater-

nities, to dance halls, to jukebox owners. Do mend the holes in the old sock in which authors keep their pay, and do provide for them to share in new revenues from their work.

Point three. We must not bury our individual creators in conditions where they can't bargain effectively with the behemoths and large economic powers across the table. Since individual licensing only works in a few situations, artists must be able to organize, monitor, negotiate, license, audit, collect and distribute effectively the moneys from the use of their work and to make themselves heard in the halls of Congress. We want artists' organizations that maximize creativity, self-sufficiency, individual autonomy, and allow for diversity and multiplicity.

Now, today, if artists organize in guilds or join organizations that maximize individual autonomy, they are clobbered with anti-trust suits and possible per se violations and treble damage consequences. For some twenty years, the blanket license of the music performing rights societies has been in the courts, and I think that it's still standing and still useful after twenty years. But stop and think about how much money, how many arts' dollars went into preserving that device, which still is with us today, without much movement. I venture to say that totting up the expenses for both sides in that litigation, we would have something in the nine figure area, and much of that money winds up in whose pockets? The lawyers' pockets, and not the artists' pockets. And it seems to me, it is a crowning irony that Congress pours money into the National Endowment for the Arts yet leaves standing laws that create arterial bleeding of arts money—arts dollars—to the lawyers with little result in proportion to the time and the money spent and much economic loss to the arts.

Now, what to do about it? Authors can escape anti-trust consequences by unionizing but, if they unionize, what a price they have to pay. As union members, they are employees for hire and the copyright law takes away their authorship status under the work for hire doctrine, which is far broader than needed, in my view, for the health of the producers, who get that favored status of being the author, and is certainly far broader than is necessary or desirable for the optimum functioning of the creative process.

In a word, authors are between a rock and a hard place and a legislative remedy is needed. And here I must confess I'm not an anti-trust lawyer, but I think I know arterial bleeding and waste when I see it. I suggest that you give consideration (a) to allowing artists' guilds and organs a sui generis quasi-union exemption from the anti-trust laws. If you do this, there must be safeguards for the public and for users so that unreasonable restraints in rates or conditions do not result. And this should be realized through some speedy, expert, impartial, umpiring agency. We have a model in the ASCAP consent decree: ASCAP's rates can be taken to the district court and the court will decide whether the rate ASCAP is quoting is reasonable and ASCAP has the burden of proving that it is. There are other possible solutions. Chairman Brennan's CRT is one. There may be other solutions, whether it's arbitration or some still other separate tribunal that I haven't thought about.

Part (b) of what I'm suggesting is that you consider exploring, apart from anti-trust, a cheap, speedy, expert, dispute-setting pro-

cedure or tribunal for copyright controversies. I think, in almost all the major law schools in the country, it is coming to be realized that the litigation model for dispute settlement is terribly costly, and the fact is that it's far too costly for the individual creators and even for their organizations. Again, you have the bleeding of arts' dollars.

In a particular copyright case, the economic considerations may be small, but the principle may be big, and the non-author party may have much greater, disproportionate resources to litigate and the capabilities to do it. Also, the concepts and the required proof of harm, which the courts seem to be developing against the good advice of David Ladd, should be revised down legislatively where infringement can be shown.

Now, those are concrete things for the new era of technology with which I think artists cannot cope unless as individuals they can organize properly, without anti-trust prosecution. It isn't something new I'm suggesting here. There are bills pending before the Congress now which permit companies to get together for R&D and, reaching the intellectual property field, would exempt or would take away the per se violation rule and take away the treble damage remedy and rest with actual damage.

That's as far as I'm going to go now. Identifying the users and uses and modes for clearing licenses will be covered by others who follow me. I'd like to leave you with a thought which is a re-statement. Our goal is to assure through our law on authors' rights that authors whose work appeals to a significant public are able to live by their art, to stand on their own feet, independent of hand-outs, whether by government subsidy or private patronage.

If we could all learn not only just to be our own individual publishers in the new technology, but to be our own artists, painters, and composers, we could fire these people for our payroll. But most of us will never be able to do these things. We desperately need our authors, the best ones we can get. The worthy ones must be assured a fair living from carrying out their professional tasks. Congress must help bring this to pass, and I think some of the measures that we will be proposing today should move in that direction. There are others, too.

Thank you.

Mr. GOLDSTEIN. Our next speaker is John C. Taylor, III, Chairman of the Carnegie Corporation and a member, as I indicated earlier, of the firm of Paul, Weiss, Rifkin, Wharton and Garrison. He earned his law degree at Yale; he is a member of the Association of the Bar of New York City and its Committee on Copyright and Literary Property, and of the American Bar Association.

John?

Mr. TAYLOR. I had originally thought that I would start today by using as an example a conversation I had with Jack Kernochan last night out there in the hall, about a legal matter in which I was insisting very vociferously that the copyright belonged to the publisher, and he was insisting that it belonged to the authors—[Laughter.]—but after hearing Professor Zuckman today, I decided that would not be diplomatic. [Laughter.]

I'm also going to refrain from a great temptation to deal directly with the two very immediate matters which we all spend a lot of

time talking about, the Betamax case, the home taping matter, and videocassettes. It was not mentioned that the way I happen to be here has nothing to do with my law firm or the Carnegie Corporation. It happens that I was invited to come here, just so there's no false pretense here, by the National Music Publishers Association for which I've acted for many years. And they are obviously the two matters that are of most importance today, in copyright legislation, to the National Music Publishers.

What I'd like to do instead is to look at some of the principles and basic approaches that can be used in trying to solve the problems that are created and presented by the new technological developments. I think there's a tendency to take each problem as it arises and try to react to it in a pragmatic way. As the new developments come with increasing frequency, that approach is going to make it impossible to arrive at a cohesive and consistent pattern of dealing with intellectual property.

As has been said here over the last couple of days, there are two principal objectives that have to be achieved: One is to encourage creativity, and the necessary elements of that, basically, are to give the author some fair control over the use of his work, and to compensate him fairly for his work. I think the example that Professor Kernochan used of what we have done to teachers in this country is an apt one. It's true that you really don't have to give an author a million dollars for writing a successful book to compensate him fairly. But authors as a group are always going to be undercompensated, and it's necessary to do something to preserve for authors a recognition and a status in our society so that bright people will continue to be authors. And what we've done with the teaching profession in primary and secondary schools by paying them too little is to put a profession which is regarded very highly in the eyes of every other society in a position where that profession is not well regarded in this country. As a result, you can't get enough really first class people to go into that profession.

The other objective is to facilitate access by the public to the copyrighted materials created. It seems to me the legislative objective should be to create and encourage an environment in which licensing of those works can be handled in an easy, fair, effective and quick way so as to make the material available to the public quickly, fully, and at an economic price.

There are a couple of dangers, I think, in the proposal legislation that has been mentioned here. I'd just like to mention them briefly. One is the danger of over-legislating. Legislating too quickly is perhaps one aspect of that. Another is creating a rigidity in the legislative structure which prevents the knowledgeable people who deal with the problems on an everyday basis from working out patterns of licensing and modifying them periodically to adjust them to the changing processes and the changing channels of delivery to the public as they develop.

The other was mentioned by someone yesterday, and I think is equally important. In drafting legislation that creates rights or creates restrictions, a high priority must be given to the method of enforcement. Creation of rights and restrictions without a really clear and effective means of enforcement does nothing but create confusion in the entire environment, and doesn't protect the rights of

anyone. I think there's a great danger, particularly as these new technologies develop, of doing precisely that.

Not all of the new developments are going to be subject to the same type of approach, I'd like to use as examples three different types of new delivery systems for copyrighted material that have emerged as a result of new technology, and talk a little bit about how each can be dealt with.

The first is the easy one: New technological development that requires licenses which are big ticket items. There aren't many licenses required. There's a lot of money involved in them. They fit within more or less the standard pattern that already exists. And they don't require anybody to do anything. The marketplace can work those negotiations out on an ad hoc basis. It's economic to do the special negotiating.

An example of this type of development was the development of motion pictures. People started buying novels and plays and even music for motion pictures. That's worked fine without legislation.

The second type is the most difficult one, and it's the one that's coming up more and more frequently. It's by far the most difficult to deal with. It is a new delivery device with characteristics making it impractical to make the user pay for the use of the material delivered, and, in some cases, impossible to identify any specific use of a specific copyrighted work or to enforce a remedy against the person who uses it without obtaining a license. The classic example is home taping.

I would submit that it's not the only one around, and if you think about what's been said in the last few days, you'll find quite a number of other delivery systems that fit into that category.

Now, there are only two ways to deal with this category. One is to wait to see if further technological development pushes it over into what I'll discuss as category three, which makes it possible to identify the use and to identify what was used and who the user is and to create a remedy to keep him from using it without a license.

The second is in some way to create a pot of money to be used to compensate the copyright owner and then to devise a formula or process for dividing the pot fairly. It's a big order. It's a tough thing to do. But it can be done, and other countries have taken a crack at it.

What is the rationale for compensating the copyright owner—I suggest there are at least two. One is that you have to replace for him the revenue he's losing from the channel of delivery which is being preempted by the new technology. The preemption by home taping is real. I don't think there is any question. There have been any number of studies done. The Senate Committee itself, if I'm not mistaken, has concluded that the home taping of audio material has resulted in lost record sales of about a billion dollars a year. And that's money lost to the composers who are losing those mechanical royalties.

The other justification for compensating the copyright owner is simply that he should be given a fair share of participation in the new industry that's developing and out of which other people are making commercial profit.

Then there's the third category of new delivery system. I think the third one is the one that is overlooked most often. It involves

licenses which have six characteristics. I'll list them, but first, in order to give the list some reality, I would like to suggest that a classic example is the licensing of music for use on videocassettes. I use that example purposely and I'll indicate why in a minute.

The characteristics are these. First, the use and the user can be positively identified. Two, there is a remedy which makes unauthorized use dangerous. There is a real deterrent to unauthorized use. Third, there are many users and there are many copyright owners involved, many of whom necessarily are unsophisticated about the economics of the industry they're dealing with. Four, many licenses are required and they involve relatively small amounts of money individually. Five, there is no existing pattern or established framework which is appropriate for licensing. And six, there are very rapidly changing market conditions and variances in the delivery channel itself.

All these characteristics apply to the use of music in videocassettes. They also apply, it occurred to me this morning, to use of software in the public schools.

Now, what do you do with that kind of situation, and what are the dangers involved? If you have those characteristics, there's no way that licensing can occur on any kind of sensible or effective basis until you create patterns and a framework for that licensing. Let's return to the example of videocassettes. There are lots of questions that have to be decided as to how you're going to license. Is it going to be a flat fee? Is it going to be a percentage? And if so, of what? Is it going to be worldwide? Is it going to be for a term of years? When do you license when the film's produced or when it's released in videocassettes? And what is the range of fair compensation, a question which obviously requires an analysis of the real economics of the industry.

The absence of a framework for licensing videocassettes has adversely affected everybody. It has severely impeded the development of the videocassette market. There is absolutely no question of that, and if you talk to any of the producers, they will tell you that. The result is that the public is denied the use of that channel as an access to copyrighted material. And both the producer and the creator—copyright owner—are denied revenues that they should be realizing from delivering that material to the public. Everybody loses.

I would suggest first of all that you can't deal with that situation by a compulsory license. I could go into why I think that, but I think we're going to—

Mr. GOLDSTEIN. I'd prefer you didn't.

Mr. TAYLOR. Yes, I've already run out of time. My suggestion for dealing with that is that there must be an environment created where the knowledgeable people on both the user and the owner side can sit down together, listen to each other's problems, practical problems that they have, learn the economics of the industry together, and arrive at patterns and ranges of consideration which can then be disseminated to the rest of the industry and can produce the framework for individual negotiations which can then be carried on. An antitrust exemption would almost always be required.

Dr. Spurlin said this morning that the major suppliers are the people with whom he'd been able to work out effective and workable licenses, giving support to this approach. The closest example of this approach is the one that Tom Brennan referred to. When Congress passed a compulsory license for public broadcasting, they were smart enough and wise enough to put in the anti-trust exemption. And what actually happened was that the public broadcasting people and the owners of the copyrights sat down and worked together and listened to each other's problems and, in fact, the licenses that were granted, at least for music, went far beyond what was required by the compulsory license.

Tom and I, I think, would disagree with respect to whether that negotiation would have taken place successfully in the absence of a compulsory license. He thinks not; I don't agree. I don't think the compulsory license was necessary. I think the compulsory license wouldn't have worked if it hadn't had the anti-trust exemption, and I think with the anti-trust exemption, it was totally unnecessary.

This approach is not for every situation, and the economics of the industry has to be known. The satellite owner situation that was raised this morning might be one area where it could work. I don't know enough about that industry. But if the compulsory license for cable is removed, maybe that's the place for an anti-trust exemption.

I suggest that that is an approach that should be considered more often in trying to deal with these problems.

Mr. GOLDSTEIN. Thank you. Our next speaker is Alexander Hoffman, Senior Vice President at Doubleday and Company. He earned his B.A. at Dartmouth and M.B.A. at the Amos Tuck School of Business. He has served with the U.S. Navy, and has been a member of the Executive Committee of Doubleday since 1969. He was director of the Association of American Publishers in 1969 to 1980, and in 1979 led AAP delegations to the U.S.S.R. and the People's Republic of China.

He is Chairman of the Board of Directors of the Direct Marketing Association and Chairman of the Board of the Copyright Clearance Center. He also serves on the International Freedom to Publish Committee of the Association of American Publishers.

Alex?

Mr. HOFFMAN. Thank you. I'll try to make this very brief and bring you good news. I think I can tell you of a concrete example of solving some of these problems. I'll speak to you from the perspective of my role as Chairman of the Board of the Copyright Clearance Center, but I must confess I inevitably speak also from the perspective of a book publisher, so you'll have to pardon that.

The Copyright Clearance Center is a collecting society, and a collecting society is the kind of entity that's been made necessary by the new technologies that make possible mass, uncontrolled reproduction of copyrighted works. There are twelve of these in the world now. The Copyright Clearance Center is the one in the United States. They all meet regularly, now twice a year, with the long term aim of establishing an internationally workable system for collecting and distributing royalties to authors and publishers.

But I'll just deal with one example to try to show you how this works.

Now, you've heard it said that the new technologies make copyright obsolete, but fortunately, I really believe that is not true and it's very fortunate that it's not true since copyright really is the only workable means for a free society to foster broadly based creative effort. Rather, I believe the problem stems most often from uninformed attitudes and fears, and that these are solvable problems. In the few minutes I have available, I'm going to try to persuade you that this is true with one concrete example which embodies principles that I think are applicable in most other technological fields.

Now, the Copyright Clearance Center came into being at the request of Congress when they passed the new law which placed limits on systematic, multiple photocopying. They said this makes necessary the creation of a workable means to measure copying which goes beyond fair use and then to collect and distribute royalties for such copying. So they urged parties who were involved to work this out together. Systematic copying chiefly affects technical, scientific, and medical publishing at present, but let's not talk about the various kinds of material; let's just deal with the principles.

When Congress asked the parties to get together and work out a means to solve the problem, authors and publishers asked the library and academic communities to join with them in creating such a system. But apparently because the latter had come to view unrestricted photocopying as a birth right, or perhaps because they really believed it posed no economic harm to writing and publishing, they refused to do so. Nonetheless, the Copyright Clearance Center was created through the efforts of authors and publishers, and with the very valuable help of one renegade corporate librarian who apparently had an extremely active conscience. And, in a nutshell, the system that we set up orginally worked like this.

Publishers entered their titles into the system—as I said, this is mostly technical, scientific, and medical journals at the start—and they set fees for copying from these journals, and they print the notices in the publications. And the Copyright Clearance Center publishes periodically a catalog listing all the material.

Users enter the system and use it by recording and reporting the copies they make. The Copyright Clearance Center then sends them a single bill. They send back a single payment. The Copyright Clearance Center distributes the money to those who have it coming.

Now, this system, unfortunately, had very limited acceptance, both because of the attitudes that I mentioned and because in the eyes of many users it required of them what they viewed as unacceptably burdensome record keeping. It was used mostly by about a handful, let's say ten to twelve, large corporations. Aside from that, this law has really been largely honored in the breach, as far as photocopying is concerned, raising the question that many of the Congressmen wrestle with constantly: do you leave a law on the books which appears to be unenforceable?

Well, let me go on and tell you that this problem has been solved, I think. After years of futile entreaties to bring about a co-

operative effort to build a better system, if this one wasn't adequate, and to make it work to everyone's satisfaction and benefit, publishers finally took the step they probably should have taken earlier, but were reluctant to take. They went to the courts.

The first actions were brought against four large corporations which were doing high volume unreported systematic copying, and these efforts were uniformly successful. But that's the dark side. It's too bad to have to do that kind of thing. It wastes money and creates bitterness, and it's bad all the way around.

Now comes the bright side of this tale. We said to ourselves, "Surely, now that these court cases have established that the law is enforceable, a cooperative effort to solve the problem should be possible since, presumably, *no* one should be interested in getting involved in a series of lawsuits with a predictable outcome." We tried a new tack. Instead of again approaching the corporate librarians, where we had really been faced with a stone wall from the beginning, we went to the chief executives of a number of large corporations and we said to them, "Sir, you run a business here that's based largely on your patents, so surely you can understand the philosophical concept of copyright." And they would say of course they do. And we'd say, "Well, now, are you aware of the obligations that your corportion has under the copyright law?" And most of them, I think quite honestly, would say, "Well, no, I hadn't really thought about it." So we'd explain it.

And usually, through this entree' we'd wind up talking to the chief corporate patent counsel, a man who would understand the concept of according to intellectual property the same rights you accord to material property, and we'd describe our existing system. Typically they would say, "Gosh, it's a big company. I can't imagine assuming responsibility for educating hundreds of thousands of employees to keep the records that your present system requires. We recognize the law. We would want to obey the law. We want to pay, but you don't have a more workable system?

So we'd say, "Well, what would you like?" They typically would say, "Well, we'd like to make a single lump sum payment for an annual license that would cover all the copying we do."

We said, "Fine. Let's both work together to see if there's a way to do that." And miraculously, several major corporations were willing to do that. After all these years of recriminations and useless fighting, once we were able to sit down with reasonable people and cooperatively try to figure out a way to do it, I think we've done it.

Briefly, it works like this. With the user's cooperation, we've developed a way to use sampling. We will go into an enterprise for a finite period of time, monitor all the copying that they do, on a title by title basis, and then we will project that to a longer period of time: a license term. Publishers enter their titles into the new system that same way as they did the old one, title by title, and they establish a copying price that's reasonable on a base plus per page basis. And then you simply multiply the projected copying volume times the publishers' prices, and you get the cost of the license. We've developed a computer system to handle all this efficiently, and it's on a title by title basis, so that the money can be distributed very accurately. Once the survey's done, the user needs

to keep no records. He's licensed for all the copying that he does for the period of the license, which can be renewed periodically.

We haven't got the time to go into the details of how this system works, how we update these audits, and so forth and so on. Suffice it to say all of these are solvable problems and are being solved.

Also, in the longer run, we will be able to use mathematical modeling to greatly reduce the need for the periodic surveys, to cut the fuss down.

This kind of system appears to have been embraced as reasonable and workable and fair by the same people who, through misunderstandings, used to fight with each other. And I hope that the first license under this new system will be signed within the next couple of weeks.* This is very close to absolute reality.

How about the future? When copies are made electronically, recordkeeping and billing can be fully automated, but a collecting society, such as the Copyright Clearing Center, will still play its same service role as a single, efficient means to collect and distribute so that the user has just one place to deal with and doesn't have to go negotiate hundreds or thousands of separate license agreements. In fact, the automating will make it more accurate and might make it more simple; in this case, technological development will improve the situation rather than make it worse. And we will still preserve the economic underpinning of independent writing and publishing.

So I think there are two lessons that have been learned from this experience. One, the importance of education on attitudes, just as John was saying. If both sides understand and respect the principle involved, workable means can be found with a constructive joint effort.

And, secondly, since human beings are apparently almost infinitely resistant to change, it takes time. We must not be hasty to conclude that a carefully balanced law which was constructed over seemingly endless years of hearings and redrafting does not work or is unenforceable.

We may periodically need adjustments to deal with some new technologies, but by and large, I'm convinced we can make the law work and that our society will benefit from that effort.

Thanks.

Mr. GOLDSTEIN. Our next speaker is George Willoughby, Vice President for Corportate and Legal Affairs of King Broadcasting Company, a major television and communications corporation in Seattle. He graduated from Stanford Law School, and practiced law in Seattle for fifteen years before joining King. He is a member of the Seattle King County Bar Association and other bar associations.

George?

Mr. WILLOUGHBY. Thank you. I would like to make it clear at the outset that I'm here on behalf of a company that's involved in radio, television, and CATV. We are basically a user of creative product. In another sense, we're also creators, because we do create local programming. However I want to address my remarks as a user or a payor (or, as Jack said earlier, a victim, perhaps) of the

*Company-wide licenses have been signed with the General Electric Co. and Warner-Lambert.

system under which creative products of one entity are used by another. (We do not seriously believe we have been victimized, but the systems that have evolved may now be in need or review and change).

The other point is that we believe, as everyone else has expressed, that what is needed is a system for administering the use of and protecting the creative rights that will encourage use of the creative product without stifling and without infringing on anti-trust laws.

This morning, there were a couple of references to a possible model to be considered, which is the consent decree in the ASCAP/BMI music licensing situation. This governs the use of music by radio and television stations in this country. I want to address my remarks to this. I realize this is fairly narrow, but I think it is practical and important to consider the one existing model when trying to arrive at an administrative device which would allow for some kind of large scale protection of copyrights or creative products.

Particularly, we're talking about the ASCAP/BMI blanket music license and as you may know, this blanket license is fairly significant to television and radio. The television industry alone, for instance, pays in about one hundred million dollars a year to ASCAP and BMI under the blanket music license. It's been in existence for a fair amount of time. It came out of a consent decree in 1950. It's probably the only single, that I know of, really large scale, and in the past, reasonably effective type of procedure that is protecting and covering both the collection and the payment for creative rights, so it's a logical example to look at when trying to devise protections in other creative areas. However there are a few cautions to be kept in mind.

For one thing, it's a blanket license, and at least from a television industry standpoint, we're not certain that a blanket license of music rights is any longer needed for local television stations. I say this as a caution because if the ASCAP/BMI license is to be used as a model for other industries or other situations, the blanket characteristic needs to be examined closely. The question must be asked as to whether or not unlimited access to a whole broad class of creative product is a necessity—do users really need access to all the various forms of the creative product for which protection is being sought.

Back in the old days of television, when live orchestras were used extensively and there was a lot of spontaneous music use, the blanket license concept made a lot of sense. However, since that time, television has really changed. The industry is much more involved with pre-recorded programming, and therefore, the need to have a blanket license which makes two million or twenty million songs available, maybe doesn't exist. There is no longer spontaneous music use in television and the pre-recorded programming is created sufficiently in advance that all necessary copyright rights could be cleared in advance as well.

The further problem with the existing television blanket license is that even if the rights to use music are obtained already from the composer, there is no meaningful carve out under the blanket license, so a double payment results. Any blanket license imposed

in any other industry to protect creative rights, should have a realistic alternative built in so that users have a true choice. It's essential that if the ASCAP/BMI model is being considered, (and it has to be because it's the only method on a grand scale used so far that's really been effective) it must be kept in mind that there are ways in which it could be improved and altered to protect creators, as well as users.

Perhaps one way would be to establish a blanket license with the built-in alternative of direct per use licensing, which in all probability could be easily handled through existing computer technology. This would provide a choice to users, which based on the television industry experience in the music area, might provide a fair and workable protection for creative product.

Thank you.

Mr. GOLDSTEIN. Thank you very much, George. Our next and final speaker is Harlan James Cleveland, Director of the Hubert H. Humphrey Institute of Public Affairs, the University of Minnesota. Mr. Cleveland served as Executive Director of the Economic Section of the Allied Command in Rome from 1944 to '46, directed a channel office in Shanghai in 1947 through '48, and U.S. Ambassador to NATO in 1965 through 1969. He has taught at Syracuse University, at Princepton, and at the LBJ School of Public Affairs, at the University of Texas. He is a winner of numerous awards, including the Woodrow Wilson Award at Princeton. He has also written several books on international affairs, management, and ethics. I might add that, in the interest of keeping things as brief as possible, Mr. Cleveland has kindly put copies of two of his writings on the podium that you might want to pick up later on as you leave. I can recommend them to you. I read them last evening with considerable profit.

Mr. Cleveland?

Mr. CLEVELAND. Thanks very much. Your staying power is extraordinary. I expect it of the members of Congress, because they sit there all the time, listening to witnesses, but for the rest of us, I think it's admirable.

I had a call a few weeks ago from Hong Kong, from a young Chinese, a nephew of a friend of mine I worked with in China many years ago to tell me that he had just translated a book of mine and was going to market it on the mainland through one of the interested presses. And I thought that the next sentence was going to be, "Is that all right?" or "Who should I write to?" or something like that . . . [Laughter.]

Not at all. The next sentence was, "Would you please write the preface for the Chinese edition?"

So a few weekends ago, I sat down and wrote my first preface to a pirated edition. [Laughter.]

I'm not clear whether that makes me a pirate, or a co-pirate, or what. But it's some indication of the state, the near nervous breakdown, it seem to me, that the copyright laws are in. It seems to me that the trouble may be quite fundamental, and it's pretty late in the day or in the session to suggest anything quite so fundamental, perhaps, but it does seem to me that the notion that facts and ideas are owned is what's on the verge of a nervous breakdown. And if we can focus on what we're trying to do, compensation for creativi-

ty, or public access, broad dissemination—which is what the Constitution makers seemed to have had in mind—without tying it to the ownership idea, we might actually get somewhere.

It might be reassuring to note that in the puzzlement that's been evident the last couple of days over this subject that we've got lots of company, that we're in the midst of what I've been calling the great theory gap of the 1980's. Keynesian economics, we describe our whole era with references to where we've just been, post-Keynesian, post-industrial, post-New Deal, and so forth, which means that we don't really know how to describe what we're in. We've got inflation and recession glued together in a possibly non-cyclical fashion, and the economists don't know what to do about that. The military strategists don't know what to do with a—now that we've developed the ultimately unusable weapon. The management theorists are only gradually accommodating to the fact that most of the world's work gets done by what the Japanese call consensus and the communists call collective leadership and we call committee work. [Laughter.]

And the law, trying to catch up with the fast break called information technology, this explosive convergence of computers and telecommunications that's been converging since the 1950's but that converged for real in the early 1980's.

The trouble, I think, was suggested by something that Judge Breyer said when he warned us against making policy by analogy. We have carried over into our thinking, it seems to me, a thinking about information which is just a symbol, concepts that worked okay for the management of things. But now the manufacture and the mining and the farming of things—is now rather less than one quarter of our economy whether you measure it by GNP or by labor force. So we are the primary resource, the key resource in our business economy, Peter Drucker calls it, is information. It's a peculiar resource. It isn't depletive, necessarily. It's often expandable. It grows with use. It's not scarce. Harvey Branscombe, of IBM, speaks of the "chronic surplus of information." It's sharable. It doesn't give rise to exchange transactions, as such. The service may be an exchange transaction, the service of delivering it, but not the information itself. And it's diffusive; that is to say, it leaks. It has an inherent tendency to leak, unlike things. As the CIA keeps finding out.

Now, the new technologies, which produce new kinds of works, software, new techniques of piracy, Xerox, videotape, the back yard dish; new means of delivery, microfiche, computerized data bases, and so on; is producing what I call in one of those articles a whole lot of Canutes in our society. That is, people who remind you of old King Canute, who stood on the beach and told the tides to stand still and then got wet. It's a bum rap, actually. The Viking historians, not the historians of the football team, but the historians of the Vikings, say that what he was really trying to do was to convince his stupid courtiers that he wasn't all powerful and therefore he was going to put on this demonstration, which was successful, in that he got wet. But his name has gone down in history as a metaphor for people who try to prevent the inevitable.

And I have, in recent years, been giving out the King Canute prize. In 1981, it was easily won by Alexander Haig for saying "I'm in control here." [Laughter.]

It was interesting, the reaction of the American people. We were neither reassured nor were we angry. We laughed, nervously—— [Laughter.]—as in watching a theater of the absurd. [Laughter.]

For 1982, it was quite difficult because there were so many candidates. There was the Association of American Publishers—— [Laughter.]

Or the NYU case, and there was HBO, trying to chase around, preventing people from putting up the backyard dishes, and there was CBS which already was an earlier case, but they tried to prevent Vanderbilt University Library from lending out copies of CBS News, but the Senator from Tennessee took (unintelligible) special law on the subject. And there was Universal City Studios versus Sony, so we finally gave the prize to the Ninth Circuit for hitching their wagon to what Congress meant to say about technologies that it couldn't yet imagine. The Supreme Court proved by what, to me, was a surprisingly narrow majority, that horse sense is not necessarily incompatible with the law. At least, not in that case.

The problem, then, may be the very comcept of information as property, just as in the accounting field, the accountants and the tax writers in Congress, for that matter, are going to have to take a new look at the concept of depreciation in an economy that's three-quarters, or maybe half, information work. It's a great bonanza; that's why the information companies are making so much money, I guess it's partly that they're able to pay the depreciation when they're not incurring it. I mean, they're able to deduct it without incurring it. But still, it requires a rethink. And, similarly, I think, in this case it requires a rethink.

It can be retarded, this nervous breakdown, by some technological fixes, and we've heard about a number of them these last two days. Scrambling signals, and that, codes of various sorts, in software, although the teenage computer hackers seem to be equal to almost everything that has been invented so far.

But the leakiness of the information resource seems to destined to overwhelm Canutish efforts to imprison it. The history of arms control and the recent efforts of the computer pirates teach us that there always seems to be a technological fix for a technological fix.

But we've really abandoned already, haven't we, the idea that intellectual creativity has to be rewarded with ownership. That's really a minority of what's going on these days. Most U.S. patents are held by organizations, corporations, universities, government agencies, not by the inventor. And many copyrights are held by publishers and promoters, not by the authors and songwriters the founding fathers probably had in mind when they sewed that provision into the Constitution.

In universities, creative work is rewarded mostly by promotion, tenure, and tolerant attitudes toward minimal teaching loads and outside consulting. As result, we generate quite an innovative research and development effort in this country without most of the scientists and technologists involving having to own the ideas they contribute. Some leaders of industries on the high tech front here are already saying that their protection from overseas copyists

doesn't lie in trade secrets, but in healthy R&D budgets. John Rollwagon in Minneapolis, the Chief Executive of Cray Research, which produces the world's fastest computer, puts it this way: "By the time the Japanese have figured out how to build a Cray I, we have to be well along with designing Cray II, or we're out of business." And that's what's made this country run along, isn't it? Always doing something that had never been done before. Not just rescuing the things that used to be done well.

So a notion of information as property is built deep into our country's laws, into our economy, and into our political psyche. But we must continue to develop, it seems to me, better ways of rewarding intellectual labor without depending on laws and prohibitions that it seems to me are visibly disintegrating before our eyes very much as the 18th Amendment did in our earlier efforts to enforce an unenforceable prohibition.

Thank you.

QUESTIONS FROM AUDIENCE

Mr. GOLDSTEIN. Thank you, Mr. Cleveland. In the interest of getting you out of here on time, I'd like to make a couple of proposals. One is that we take questions until 6:45 from members of Congress and staff first, of course; and second, following that, that we move directly into the summation by the Rapporteur. There will not be much of a transition there; I'll just quickly change hats.

So, if we could start with questions. I take it that indicates the hour rather than a lack of provocative points raised. Mike?

Mr. REMINGTON. Mike Remington, House Judiciary Committee. I have a question for Mr. Cleveland. Traditional copyright has criminal penalties. It is treated as property. We've seen, as you suggested in your statement, that some of the new technologies are transitory, they're microscopic in size, and so forth. My question is the following: how equipped are our governmental institutions, prosecutors and courts, to treat copyright in the context of the criminal laws.

Mr. CLEVELAND. Well, it seems to me that the courts are already trying to do far too much and with all this talk about alternative dispute settlement and so on, the notion of loading on the courts a whole new generation of cases, you know, a thousand Betamax type cases on various technologies, is just appalling. They can't handle the business they've already got, and we're doing probably a worse job in criminal justice than any other industrial country today.

So it seems to me that we simply have to work out intermediate systems, and I think some of the discussions about the Copyright Center and the ASCAP formula and so on are interesting ways of getting at an intermediate formula.

It seems to me that the vast majority of this kind of business, of making sure that the creators are compensated for creation, which is an important objective, treating information as property isn't, but compensating the creators is, that we just have to look for those intermediate formulas.

And I would opt for every possible formula that would keep all but the occasional sort of policy setting case out of the courts entirely.

Mr. GOLDSTEIN. I think John Taylor would like to respond to that question as well. Oh, you didn't?

Mr. TAYLOR. I wanted to ask a question (inaudible).

Mr. GOLDSTEIN. Okay, we'll let's hold on to that then, for a moment. Yes, sir?

Mr. FISH. Ham Fish. Mr. Cleveland, just a point of clarification. You were challenging the concept of information as property, and do I interpret you correctly that you're talking about assembled information and not original books or authors or artistic works?

Mr. CLEVELAND. I think you could probably make a distinction between, say, a poem or a piece of music or a romantic novel and the other 99 and a half percent of the knowledge industry, which is everything else we do, and everything that everybody in this room, after all, are information workers.

And it may be that that is the way to go on maintaining the very narrow construction of the Constitutional mandate, which is there, after all, but working out a different system that doesn't require us to contort ourselves to think of all the other kinds of knowledge and information that are crowded on our desks as belonging to somebody. I mean, to me, the notion of owning an idea or even owning a fact is, you know, very hard to grapple with, intellectually. And much of what is talked about as being owned and protected is really, as was said by several other people, is really assembly work and not—like the data bases—and not the original—not creativity in the Constitutional sense.

Mr. GOLDSTEIN. All right, thank you. If there are no other questions from members of Congress or staff, I know that Mr. Cleveland's remarks prompted—are going to prompt—some questions both from Bud Taylor and from Alex Hoffman. Bud?

Mr. TAYLOR. Well, actually, I'll respond to that question because what I was going to say fits closely enough where I can fit it into that mode.

I think that Mr. Cleveland has begged the issue right away when he talks about ownership of information. Copyright has never attempted to protect or give exclusive rights to facts or information, and anybody who's ever practiced in the copyright field is always facing that problem. And when you get a work which is the packaging of facts and information, it has always created difficult problems in copyright.

The typical example is a biography. If somebody writes a biography and then somebody else does another biography, how close do they have to be and how much do they have to appropriate before they're infringing that copyright or just making fair, legitimate, unprotected use of the facts that were in that biography.

What is creating the problem today with the growth of computer technology, the accessing and the accumulation of data and facts has become so important and has become so expensive to create that it's beginning to get the two areas all mixed up together, and I agree with Mr. Cleveland, I think that you can't deal with data banks and that kind of fact accumulation within the traditional sphere of copyright. But, because you can't deal with that, let's not

destroy or do away with a copyright system that protects artistic works and original thought and the creation of new ideas which has worked so well for so many years.

Mr. GOLDSTEIN. Alex, I think you had——

Mr. HOFFMAN. Saved me from saying that, and to repeat, we're trying to protect original creativity. Nobody has ever talked of ownership of facts and ideas. That's an absurdity. Of course you don't own facts and ideas, you own—what you're trying to protect is the ability to create unique expressions in whatever medium, and you talk about the Association of American Publishers winning your Canute Award——

(Simultaneous discussion—unintelligible.)

Mr. HOFFMAN. This is very important. [Laughter.]

Okay, runner-up. Is that this gets at the very point of what is the concept of copyright. Now, what was involved in the NYU case? Publishers had sat around for years, trying to avoid doing this—taking this action, because it's very distasteful. What was the action? The exhibits in that case were 43 homemade anthologies, where a professor would go into a copy shop and say "I've got 60 students in Sociology 12. I want you to make 60 sets of this material. I want you to copy two chapters from this book, three chapters from this book, one chapter from this book, these articles. I want you to bind them. I want 60 sets, and I'm going to sell them to the students, say, for $35.00 or $40.00." All of this without permission; all of this without payment.

Over the years, we have published lots of anthologies. We can't do that very much any more, because they are all stolen. That's pretty important.

Now, that case was so open and shut that it didn't go to trial, finally. That is simple, pure, stealing. And it will undermine the economic underpinning of a whole category of publishing if it isn't stopped. You may call that Canute, but God help us if that sort of thing is accepted behavior. Because a whole lot of writing and publishing is going to go away.

Mr. GOLDSTEIN. I think we have time for a response from Mr. Cleveland and then just one last question. I noticed that Deborah Leavy had——

Mr. CLEVELAND. My point, essentially, is not—I'm not trying to make a moral point or even an economic one. I'm just trying to make the point that if a rule is unenforceable, then trying to pretend we're enforcing it is bad news for governors. And I think that this rule has, for most cases—this may not be true of the poem, for example—but for most cases, it seems to me that this rule is unenforceable and that simply to try to make a more and more complicated piece of legislation require more and more recourse to the courts about something that is going to be widely honored in the breach anyway, is the way to give disrespect to the law.

Because one other angle of copyright that hasn't been mentioned at all since yesterday afternoon, at least, when I got here, and that is the right of the author to have his material be considered with integrity. My right not to have somebody reprint, taking out all the best paragraphs, for example. And I think that's even more unenforceable in any court sense, but has a moral position which I think is perhaps more sustainable than the compensation part.

Mr. GOLDSTEIN. I think Deborah Leavy had a question.

Ms. LEAVY. Yes, I did. Chris Burns put a slide up this morning, showing at the top of the slide an abstract that had been prepared at some expense, saying that through dissemination, the information had lost a great deal of its commercial value. I think that we've seen that information has a commercial value as property, whether it's the facts that have the value or the presentation of the facts. That comes into conflict with the First Amendment value of access to information. When it is a newspaper that publishes the information in that abstract, and is then considered to have devalued that information, I think that that's where we start to get into problems. That's where I see the tension coming, because information has commercial value.

I'd like someone to comment on that. Dr. Cleveland.

Mr. CLEVELAND. I read his chart rather differently. It seemed to me that he was showing the way information turns up in all sorts of differents forms, the total of which is more valuable than it was when it got started. I mean, that's what the whole advertising agency, that's what the government propaganda industry is doing, that's what public relations industry is doing. They're enhancing the value of the word by spreading the word, and that's what the economics profession is having such a time with these days, because they don't know how to price information because they've all been brought up in the same economics courses that I took that economics is the science of the allocation of scarcity. And when you get to the allocation of abundance, they don't know how to deal with it, and that's one of the—that's got to be one of the new breakthroughs in economic thinking.

Ms. LEAVY. Well, if I could just follow up. It seemed to me that when Chris Burns put that slide up, he said that the end result, after all this information had been widely disseminated, would be that the company that had published the abstract originally, or issued the study, would try and keep it more secret next time—that's the reason I had drawn that conclusion, and I guess my question really is, will restrictions on dissemination of information increase or decrease creativity, since it's all a process of feeding off, one off the other. That's a First Amendment value problem.

Mr. CLEVELAND. It goes beyond the First Amendment, though. It's really the value of dissemination of information which is one of the main motivations for the constitutional provision on the authors, has a social value in itself. And even if the company that started the chain finds that it can't make as much out of the information when it's spread all round, the total social value of that information having been spread around seems to me far greater, and from Congress's point of view, that's the side of the fence that they have to try to protect.

Mr. GOLDSTEIN. I'm going to exercise my moderator's prerogative and be slightly immoderate and close off questions at this point in the interest of time. I'd like to thank our panel very much for providing——[Applause.]

You're certainly welcome to stay here. I shall not be too long.

Let me quickly shift hats from moderator to rapporteur.

RAPPORTEUR'S SUMMATION

In my role as Rapporteur, I have been asked to synthesize this weekend's proceedings, and to try to distill the important lessons learned. Although, obviously, I cannot reflect everything important that has been said here, I believe that I can, at the very least, describe three central themes that have pervaded this Symposium and that have variously been touched on in the remarks of the speakers, in questions from the participants, and even in some of the technology exhibits. In the spirit of this symposium—which is to take a highly objective, policy-oriented look at copyright and the new technologies—I shall express these three themes not in terms of solutions, but rather in terms of options; not in terms of answers, but rather in terms of questions.

Haines Gaffner accurately capsulized the first two of these themes in his reference to the two polar concerns of policymakers in this area: software on the one hand, and transmission and access on the other.

Software. Should computer software, and allied subject matter, be protected by copyright? This simple question leads to some deeper issues: Do we need more investment in the production of computer software? If so, will copyright protection induce the correct level and direction of investment in software production? Will some other intellectual property be more efficient? More equitable? The importance of these questions is amplified by yesterday's demonstration of Control Data Corporation's PLATO library—a library that, according to Jean Harris' presentation yesterday, consumed a one billion-dollar investment.

Transmission and access. The questions here concern rights and infringement, not only of new copyright subject matter, but also of more traditional copyright subject matter. To what extent should copyright subject matter be protected against new uses facilitated by computers and other new technologies? Note that it is characteristic of these uses that they will often be decentralized and undetectable. The problems created by such new uses were exemplified by at least two of yesterday's exhibits—the demonstration of home satellite antenna reception, and of the disencryption of Visicorp's programs by a competitor's program, named—with true gallows humor—"Copywrite."

I.

Should copyright protect computer software? The discussions this weekend have reduced this question into three sets of subsidiary questions:

A. Are market conditions in this field such that producers need some form of protection, or subsidy, to stimulate the desired level of investment? Jean Harris' figure—one billion dollars to assemble the PLATO library of programs—certainly suggests some form of protection is needed to enable investors in the position of CDC to recoup their investment, or that some form of direct subsidy—from government or private foundations—is needed to serve in place of private investment. It is suggestive, certainly, but not necessarily conclusive.

B. If it is concluded that producers do need protection, should that protection take the form of property rights, or will technical self-help—program encryption, for example—be more cost-effective? Martin Greenberger noted last evening that WORDSTAR—one of the most widely used programs—achieved its commercial success without resort to encryption. Further, the Visicorp example suggests the limits to self-help through encryption. And, even if encryption is found necessary to protect investment, and even if it did work effectively, we might ask whether we want to encourage the development of forces that will devote fine minds, and much valuable time, to the production, and destruction, of ever more elaborate encryption safeguards—minds that might more productively be applied to the development of new, positive programs instead.

C. If all of this suggests that legal protection is desirable, what form should that legal protection take? Is copyright the appropriate vehicle for protecting software? Copyright law's traditional design has evolved over centuries to meet quite different needs, and may not be appropriate to this subject matter. Copyright might, for example, offer more protection than is needed in some respects, and less than is needed, in others. Register of Copyrights, David Ladd, addressing a closely analogous issue, observed yesterday that, assuming some kind of protection is desirable, it may be necessary to look outside copyright when dealing with data bases. Do the costs and benefits of (i) taking the copyright route net out to be more or less favorable than the cost and benefits of (ii) adapting some other, existing intellectual property system to the protection of software, or (iii) adopting some entirely new system specifically designed to protect software? Earlier today, Congressman Smith raised some questions that pointed in this direction—asking whether it might make sense to break copyright down into more discrete subject matter-oriented vehicles.

II.

Let me turn to the second theme touched on in these proceedings—transmission, access, consumers, and the administration of rights in both traditional and new copyright subject matter. What have we learned here?

One thing we've learned is a new word: downloading. From the examples given, though, I think we have also learned that this word is just a new way of describing an old and central quandary in copyright law: What uses of copyrighted works should be proscribed and what uses should be permitted? Although some of yesterday's speakers expressed the assumption that copyright law protects only against the production of a work in tangible copies, the truth is that copyright has, for well over a century now, also protected against a wide range of nontangible uses, such as often occur in downloading: performance, distribution and, more recently, under the 1976 Act, display of copyrighted works.

Although this might seem a minor quibble over words, I believe that it illustrates a larger problem in the legislative process: the risk of being distracted by new jargon and the risk of thinking that these new terms express new phenomena that need to be treated on new principles. The larger, connected danger is that of false

analogies. As Judge Breyer noted earlier today, the analogy that grips Congress' attention will be the one that controls it.

Put in this frame, the question of liability for downloading does, however, helpfully exemplify the main challenge that the new technologies pose to the administration of copyright: should we extend rights against uses, facilitated by new technologies, that are widely dispersed, decentralized and frequently undetectable—not only downloading, but also library or office photocopying and home videotaping and audiotaping. How do we manage copyright in a world in which everyone is his or her own publisher or producer, truncating the traditional patterns of distribution?

In an ideal system of property rights, painted by some participants in this Symposium, everyone who uses a copyrighted work will pay something for this use—be it an amount that reflects the information's cost to the producer, or its value to the user. Yet, from the very start, copyright law made no pretense that this ideal was attainable, efficiently or equitably. From the beginning it was assumed that many uses of copyrighted works would go uncompensated. The married woman who bought a copy of "Uncle Tom's Cabin" and, after reading it herself, shared it with her family and then with her friends, paid neither more nor less for this widely-used copy than the lonely bachelor who bought a copy and only read it himself.

What has changed is that the new technologies have dramatically escalated the degree to which copyright uses today may go undetected and uncompensated. Now that the new technologies have disabled market transactions in many contexts, the question arises whether these new uses should be free, or whether the basis should be laid for new forms of market transactions.

The question whether new rights should be created has quickly been overshadowed in our discussion by the question: How can the transaction costs of policing copyright uses be reduced to acceptable levels? Don Devine has referred to such relatively low-cost and non-intrusive compensatory schemes as volume discounts to major centralized users. Another suggestion was dual pricing under which libraries and other centralized users would pay one—presumably higher—price while individual users paid a lower price for the same work. Another possibility, noted by Mel Harris, is simply self-policing among individual users.

Should new institutions be erected to police new rights? One caution, pointed out by more than one Congressman at this Symposium, is that we must be careful to avoid enacting laws that cannot be enforced, for the result will be disrespect for the law generally. A closely related point is that we must do what we can to educate the public as to the purposes of copyright law, generally.

If new laws and institutions should be created, should they be aimed at simulating market results or should they be aimed at some other object? Should they be run by government agencies, of the sort described by Chairman Brennan of the Copyright Royalty Tribunal, or by private organizations, like ASCAP and BMI, as described by John Taylor and John Kernochan? Or should they follow the pattern of the Copyright Clearance Center, as described by Alexander Hoffman? And, if these institutions are to operate in

the private sector, should they be regulated by antitrust decree or otherwise?

There also has been some suggestion that the problems that the new technologies have created, by proliferating decentralized uses, should not be allowed to obscure the potential ways in which these very same technologies—as data storage, computation and retrieval—can in fact be employed to enable every user to pay for what he or she uses, by maintaining, recording and calculating each use, be it photocopying, or borrowing from a library—or downloading, for that matter. Needless to say, though, the concern for protection of individual privacy, as expressed by Mr. Berman, is implicated here.

Although the problem of decentralized uses has occupied center stage in the discussion of rights—in the Congress, in judicial decisions, in public policy debates, and in our own discussions, too—I should note another aspect of the administration of rights that was considered in this Symposium and that was well underscored by the remarks of Joseph Lash, John Taylor and John Kernochan: What are the implications of these new, technologically facilitated uses for the returns paid directly to the authors, composers, and artists who make the copyright engine run? In what ways can new technologies be harnessed to achieve the more equitable distribution of royalties to the creators of copyrighted works? Parenthetically, Joseph Lash's example of his photocopying activities in Columbia University's Russian collection should remind us that the questions of use and production are closely connected in copyright: To produce knowledge requires using information created by others. This knowledge, once produced—and copyrighted—will in turn become a source of information for still others in their production of knowledge, and so on, in what is hoped to be a never-ending chain.

III.

Finally, I would like to touch on a third theme that, although not expressly addressed in these proceedings, underlies all that has been said and, indeed, represents the very reason for our being here: How can the House and Senate Subcommittees charged with responsibility in this area, and how can the Congress generally, best position themselves to monitor the new technologies and to adjust copyright, and possibly other intellectual properties, to maintain the needed balance between incentives to the production and consumption of new information?

If any one point has been made clear these past two days, it is that technology is advancing at a pace far greater than the capabilities of the national legislature to keep up with it. Congressman Kastenmeier poignantly reminded us in his introductory remarks that Congress, in passing the 1976 Copyright Act, perceived the need to temporize on some emerging, already problematic, technological issues in order to achieve final resolution of issues that had long been pressing for remedy. I was struck in this connection by Haines Gaffner's bromide respecting the new technologies: "When you are working on the cutting edge of technology, the main thing is to stay behind the blade." That applies at least doubly for Con-

gressional efforts: "When you are legislating on the cutting edge of technology, the all-important thing is to stay behind the blade."

I say, "it applies doubly," because there are variables other than technology and the legislative process that are implicated here. Let me just identify four.

A. One is the crucial issue of timing. Earlier today, Senator Mathias noted the ever-present danger that, even while Congress is deliberating on these important issues, changing economic realities may very well entrench the new technologies, thus concluding the issue being deliberated, and precluding a principled result. Don Devine pointed out that personal computers will experience their greatest growth in the next decade—a far shorter horizon, no doubt, than Congress can possibly contemplate in dealing with that growth.

B. Second is the problem that economists refer to as distributional effects, and that Dr. Spurlin more graphically described as the possibility that public policy decisions in matters involving the new technologies can very well widen the gap between the haves and the have-nots—or, as Clyde Washburn indicated, between rural and urban users—in terms of access to vital information technologies.

C. Frederick Weingartern alluded to the great intellectual tradition of sharing ideas that characterized the efforts of early developer as in this field, and that characterizes first-rate scientific research generally. Will existing or new intellectual property laws erect barriers to otherwise collegial communication? Care must be taken to attend to these possible effects which can only impede technological advance over the long run.

D. Fourth is the international setting. This naturally raises the question of the extent to which steps to encourage software production will affect our national balance of trade. Related to this is the question of piracy on an international scale as developed by Harvey Zuckman's questions to the panel he moderated earlier today. There is also the question of our ongoing obligations under international copyright treaties. In this last connection, I might note that while it might seem efficient to break copyright into separate laws, each dealing with a discrete form of subject matter, this method, to the extent it produces substantive gaps between our law and the laws in force elsewhere in the international copyright community, may put us in default of our obligations under the Universal Copyright Convention and effectively bar us from ever joining the more rigorous Berne Convention.

What institutions can Congress employ and encourage to engage in the needed, systematic monitoring and oversight?

1. More meetings such as this would certainly be productive; but they are also incredibly taxing, and I don't know how frequently the members of Congress—occupied with so many other concerns—will find themselves able to pay that tax.

2. The hearing process is certainly another possibility. I would remind you that Macaulay's seminal statement on copyright, already alluded to by Judge Breyer and Professor Kernochan, was made on the floor of another great delibrative body—the House of Commons. The broad-ranging hearings conducted by Congressman Kastenmeier's Subcommittee this past July, on copyright and the new technologies, is certainly a more immediate example.

3. The governmental commission is another possibility. CONTU—the Commission on New Technological Uses of Copyrighted Works—created by the 1976 Act, provided some helpful guidance in the area. Senator Mathias' bill, S. 2192, to establish a Commission to Study the Concept of the Public Lending Right also points in this direction.

4. Perhaps, too, there is a need to look outside Congress—to some independent facility, possibly unversity-based, funded through foundations or supported through some other means—to provide the Congress with systematic advice on these important issues of public policy.

I do not mean to suggest by any of this that the task of designing such an institution for oversight and reporting will be easy or quick. I only mean to suggest that, if I read the evidence presented at this weekend's proceedings correctly, the task is an important, and possibly a necessary, one.

Thank you very much. [Applause.]

Mr. LEIBOWITZ. Thank you, Professor.

I just want to remind you that we have a reception beginning in just fifteen short minutes, and then the dinner to follow at 8:15, where we will have Frederick Pohl as a very illuminating guest speaker.

This concludes the second day of this symposium in terms of the panel discussions.

INTRODUCTION OF SPEAKER

Mr. KEPLINGER. Good evening, ladies and gentlemen. We're here again for another evening following a very, very heavy day, and I hope that everyone has had a chance to enjoy their dinner and get started on the dessert.

We're privileged this evening to have with us one of the great writers of the science fiction world. I feel uniquely privileged to be able to make this introduction for our speaker this evening, as someone who reads every science fiction book which comes out. There are about five authors that I think are really the great ones in the field—we are privileged to have Frederick Pohl as our speaker this evening, a science fiction writer who has won virtually every award that a science fiction writer can achieve.

His achievements lie not only in the second part of that term, "fiction," but in the first part. He's been recognized by the American Association for the Advancement of Science for the accuracy of the predictions that he's made concerning the science in his science fiction stories, and he's graciously agreed to speak with us this evening and to share some of his ideas about the future with us, and what may be happening.

It gives me great pleasure to introduce Mr. Frederick Pohl. Thank you. [Applause.]

DINNER SPEECH

TRENDS, DEVELOPMENTS, AND PROJECTIONS

Mr. POHL. A couple of times in my life, I've had the experience of being on a panel in an afternoon and then giving a talk in the

evening, and sometimes getting so carried away with the sound of my own words on the panel that I blew my whole talk for the evening. Today, I had a somewhat different experience. There were three other panels that seriously worried me, because they were touching on the subjects, or at least some of the subjects, I wanted to talk about. So, those of you who don't like longwinded speeches will be happy to know that this is now four pages less than it started out to be, because you heard part of it in the panels today.

I asked Mike Keplinger to mention the Triple A-S and the Encyclopedia Britannica when he introduced me. That's a ploy to entice you into believing some of the things I say, because for some reason or other, science fiction writers are not universally regarded as wholly authoritative all the time.

On the other hand, you've heard an awful lot of really authoritative people today, telling you all the copyright aspects of high tech media, about the production of software, not to mention the ever-popular "downloading," which I used to think was called "free-loading"——[Laughter.]—in all of their manifestations. So I assume that you all know all about all of these subjects already. Anyway, if there's anything you still have to learn, you're not going to learn it from me. I have neither competence nor incentive to add to your knowledge or your confusion in these respects.

What I would like to do is to discuss the question of copyright from a somewhat different point of view; that is to say, from the point of view of the raw materials end of the production and copyright consumption chain: The person to protect for whom the copyright laws were first devised, because I'm one of these people: I'm a writer. My excuse for standing before you tonight is that if it were not for us writers and others like us—the composers and the artists and so on—there just would be no reason for this conference, or for copyright in the first place.

Before I came here, I read a paper by our host, David Ladd, Register of Copyrights, which had some flattering things to say about us raw materials producers, particularly a quote from Count Alex deTocqueville, who said, "From the time when the exercise of the intellect became a source of strength and wealth, we see that every addition to science, every fresh truth, every new idea, became a germ of power placed within the reach of the people." And Mr. Ladd goes on, "It is to provide the resources to reward and thus sustain and motivate authors," and I presume other people who create things, "that is the central idea of copyright."

Now, as a writer, I think that emphasis is very well placed. In fact, I might go even farther. You see, from the writer's point of view one sees, the entire mechanism of publication and copyright, distribution and vending books, in a quite different way than from the point of a view of a librarian or a journal editor. My job as a writer is to put words on paper. The reason I do that is so they can be read by, hopefully, some millions of people who want to read them, most of whom I will never meet, many of them in countries I will never visit.

Now, although I am a writer, I am not wholly lost to reason. I know that there are many people who will have to be involved in getting my words to the reader in Tulsa or Edinburgh or Tokyo, who wants to read it. I spent a lot of time over the last forty-odd

years, working as an editor, a literary agent, copywriter, specializing in book advertising, assistant circulation director of a couple of large magazines, and so on, and so I am aware that there is an enormous superstructure of publishers and editors and proofreaders and promotion departments and salesmen, warehouses, libraries, retrieval systems, and all sorts of other people and processes involved. But from my point of view, these are what I describe as the software, which I maintain at great expense to myself, just to get my words from me to the people who want to read them.

I suppose that if I were a hog in the Omaha stockyards, looking across the street to the slaughterhouse, I might feel about the same way. I could convince myself that all those farm hands and veterinarians and butchers and sausage makers were just my personal servants [laughter] having no purpose in life except to see that my juicy chops were served up on somebody's table. [Laughter.]

Fortunately for me, that process is a lot less painful for a writer than for a hog, or at least somewhat less terminal. [Laughter.]

On the other hand, the act of getting ready to be published—or, in the case of the hog, slaughtered—is easier for the hog than for the human. All the hog has to do is eat. The writer has a harder job, and I would like to explain some of the technical aspects of it with, as my scientific friends say, the numbers in.

The method of generating a novel is very simple. If you want to write one, all you need to do is get hold of some paper and a typewriter or a word processor or a pencil—well, several pencils. If what you wind up with is a typewriter, say, the sort of Selectric II that I've been using, you will see when you sit down at it that it has 57 keys staring up at you. All you have to do is hit one or another of those keys, one after another, half a million times.

Now, that's not hard if you're a fast typist. You can probably do it in a forty-hour week. [Laughter.]

The trick is that you have to hit them in the right order. [Laughter.]

And that means that you have a lot of individual decisions to make. In an average 60-character line, about 3,200 choices to pick among, and you have to do that for your novel about 12,000 times.

It isn't really as hard as it sounds, or not quite as hard, but making decisions is the hard work of writing. It is why writers who sit at their typewriters for an hour and more manage sometimes not to produce a single word, because they can't make up their mind what that word should be.

I try to write four pages a day, and a couple of months ago, I set an entire record for myself that I hope never to surpass, trying to do those four pages, I sat there for ten hours, and at the end of the tenth hour, I had not only finished a page or even a word, I had typed one letter. That was very painful.

However, the decisions about which character, which key to press, don't have to be made as laboriously as the numbers might suggest, probably because some of the key combinations are meaningless; mostly because a lot of that decision making is done at a subconscious level. When I'm writing, I don't think about keystrokes, I think of words and sentences, and my fingers know what to do.

Of course, the reason my fingers are so smart is that the exigencies of my profession have forced me to become a pretty fair typist—sloppy, but quick. If you happen to operate by the hunt and peck system, then you do have to make all those 40 million separate decisions. At present you do, at least, but relief may be just over the horizon. Computers are getting smarter all the time. Perhaps one day soon you will be able to buy a smart computer program, to substitute for the smart fingers you don't have, and so become an instant master typewriter operator. You can already buy word processor programs that contain a dictionary. This file will convert you into a mediocre speller, providing you have begun as an absolutely abominable one.

The program, unfortunately, takes no notice of context, so if you misspelling converts the word you want into another real word that isn't what you want, the machine won't challenge it.

There are non-technological solutions to this problem for many writers. Traditionally what they do is marry somebody who can spell. [Laughter.]

Some find the word processors cheaper in the long run. [Laughter.]

And there are other ways of eliminating a lot of those decisions through the kinds of creation that are called stochastic or aleatory; respectively, random art or found art.

Years ago, I shared an office with a stochastic artist. He did his work with his brush and a comb. First he'd tack up his canvas on the wall, then he dipped a toothbrush in some paint and he'd pull it back or put a comb across it, and it would splash on the canvas, sometimes on knees, sometimes on my manuscript . . . [Laughter.]

And the result was stochastic painting, constrained by the facts that he chose the colors and aimed at more or less where he hoped it would go; random in that he couldn't really control the individual droplets. He got some pretty effects on his canvases, and now and then, he actually had some hung and people bought them. And he was only doing, in a primitive way, what a whole generation of video artists are doing in more high tech and complicated ways today.

Around the same time, I used to play poker with a bashful young fellow named John Cage, who is today perhaps the world's best known practitioner of the aleatory school of music composition. Cage takes music where he finds it. One of his—I don't know if compositions is the right word—one of his performances takes place on a stage with ten radios on tables across the stage. Each one has a man, who possibly could be called a musician, standing by it, and each radio is tuned to a different station. And the performance involved each of these people turning the volume on his station up at more or less at random, to volumes that they like.

This is not the sort of art that most people enjoy, but it is interesting. And there are several reasons why I'm glad I am me instead of the Register of Copyrights, and one is that I would not like to face the problem of whether John Cage's compositions are copyrightable or not. For that matter, I'm not too sure that some of the compositions that most of us regard as pure music are wholly copyrightable because quite a few of them contain found themes—such as Tschaikovsky's 1812 Overture and so on.

Our writers don't make much use of aleatory composition because we sort of frown on it and call it plagiarism. Stochastic composition does exist. William Burroughs is supposed to have written one of his novels by typing it all out and then slicing it in half and pasting the lines back at random. I don't know any other writers who do that, although I know some whose work looks like it. [Laughter.]

But other stochastic processes have been used for a long time in the days of the pulp magazines. When I began writing, you could buy a thing called Plotto, which was a deck of cards. You'd deal yourself out a story. The first one would tell you the name of the hero, name of the heroine, and so on. Look at a different part of the card, and it'd tell you the color of their hair, what they do for a living—electrical engineers or highwaymen or garbage collectors or Congressional aides, or . . . [Laughter.] . . . various things, and if you just dealt them all out, you would sooner or later have a story. Not a good story, but you'd have a story.

Of course, that sort of data store is easy to work into a word processing system. If you add to the stochastic function of generating random plot elements one of picking up appropriate sentences and paragraphs to embody them in, you have machine to write short stories. And such programs do exist, although in a very rudimentary level. I have seen those machine-generated stories and machine-generated poems.

They're not very good, on the average; but on the average, most stories by human beings are not very good, and the computer hasn't been practicing as long.

There's actually a fairly easy program to write a stochastic, or random, poem. It's so easy that you don't need a computer to do it. All you have to do is next time you have time on your hands when you're in an airplane, hovering over LaGuardia or O'Hare, or in Miami, and have nothing left to read except the airline magazine which you've already looked at and somebody has torn the best pages out of it anyhow, what you do is select an article. You write down the first word in the article. Then you look through it until you find that word again, and you write the word next to it. Look through till you find that second word, and repeat the process until you have what you are able to convince yourself is a poem.

Now, here's an example of one I did last week between LaGuardia and Detroit—[Laughter.]—using a book of short stories published by a friend of mine. This is the poem.

"It was the door,
And terrifying before,
Yes, darkly, for the fifth bubbling air
and the sun grew deeper."

[Laughter.]

Not bad words. [Applause.]

If I had worked longer, it could have been a longer poem—[Laughter.]

Not necessarily a better one. It even has a rhyme, although, of course, that's only by accident.

It took about an hour and I'm not really sure that the effort was justified, because I probably could have written one myself almost

as good in that time. But computers read much more rapidly than I do. If you have one at your disposal, after you've written a program, you could probably do a poem just as good as that in three or four seconds, and you could probably do a lot of them. Then, at Christmas, you could give them to all of your friends. [Laughter.]

There is another reason for which I am glad I'm not the Register of Copyrights because, granted that these poems can be called creations of some sort, it strikes me as pretty hard to decide who created them, or what created them. I suppose the problem has already come up, not only in prose and poetry, but surely in music. When my friend, John R. Pierce was the Research Director of Bell Labs, he and some others put together a record of computer-generated music called "Music from Mathematics," and I think that was copyrighted.

So far, I've only been talking about the copyrighting of modes of supplementing or distributing kind, of artistic creation that have already come to exist, specifically those created works which were designed to be read by the eye or heard by the ear. But we have a lot of other senses and there is no reason why some of them cannot be added to our work; in fact, some already have. The nose is the beneficiary of the thing called "Smellovision," when you can see a film with a scent track of perfumes and odors blown through the ventilating system of the theater as you watch the story on the screen. And also with the scratch and sniff patches that sometimes appear in magazines that promote a new perfume or a toothpaste or deodorant.

As far as I know, no enterprising publisher has yet to insert scratch and sniff pages into a novel. It's easy to see how it might work. If you have a strong aroma of pipe tobacco, you'd know Sherlock Holmes was around somewhere. It might help the story along.

The same could be done with taste, with every volume carrying in a little packet over the flyleaf a time-release capsule with all the flavors at a Elizabethan banquet that they were eating, or the one we ate tonight, and so on.

That only takes care of the five known senses—What about extrasensory perception? Most people who know me would be surprised to hear that I have voluntarily brought up the subject of extrasensory perception. I usually stay far away from it because I happen not to believe that it exists. I hate to say this, because every time I do, I make so many enemies. People I don't know generally assume that, as a science fiction writer, I'm supposed to believe in everything—not just telepathy and clairvoyance, but flying saucers and dowsing and the Tooth Fairy——[Laughter.]

And I would like to believe in them, or at least, some of them, but the evidence is simply not any good.

Still, if ESP does exist—and I try to keep an open mind—then it's fairly likely that sooner or later someone will find a way to record it, and then the next step is to create new works in it and sell them. Whereupon, they will need to be copyrighted to prevent some unscrupulous telepath from passing off somebody else's mind emanations as his own. [Laughter.]

And, actually, that may not be entirely preposterous. I said I didn't believe in extrasensory perception; that is, the communication of one person with another without the use of his senses, as in

telepathy. But I'm not beyond hope entirely; I do believe that it is possible for a human being to communicate in an extrasensory way with some things that are not human at all. By things that are not human, I don't mean elves or ghosts or aliens from the Planet Mongo; I mean machines. You all know about brain waves. Some of you may have had or certainly may know someone who has had an electrocephalogram, which measures tiny electrical pulsations within the brain to check how well all its parts are functioning. Some of you may have had the experience of seeing your own brain waves, particularly the kind called alpha waves, displayed on a CRT or television monitor.

Unless you have sophisticated electric equipment, you have no way of knowing these waves even exist, which makes it all the more remarkable that some years ago, some experimenters discovered that a good many people could exercise conscious control over the frequency and amplitude of these brain waves. On command, they could make them go faster or slower, they could make the peaks higher or flatter. None of them knew exactly how they did it. Some said they held their breath, some said they bent some kind of muscles, others envisioned particular kinds of scenes, but most of them couldn't give any explanation at all. But they could in fact change the display of their alpha waves at will.

And someone else realized that it would be relatively easy to hook up a machine to read these alpha waves without ever displaying them in any way, or at least in any form that human beings could perceive. Then a machine could be taught—or programmed is a better word—to respond to these unseen, unheard, electrical emanations by going faster or slower, by turning on or off and so on. As far as I know, no one has yet made any practical use of this phenomenon, but it seems to me at least possible that one day you will have to add to facsimile and optical scanning and all the other things that we've been discussing the alpha wave transmission art form.

Well, that's the obligatory fantastic imagining that you have to expect of a science fiction writer—although since the U.S. Court of Appeals ruling in Apple versus Franklin last September, it may not be entirely fantastic. I doubt that much of what I have said would be of direct help to anybody in their deliberations. Still, I would like to take the opportunity to lobby a little bit, if I may. There are some things I would plead with you to keep in mind. Foremost among them is the special consideration that I think is due to the original creator of copyrightable material.

I don't deny that publishers have rights; and they wouldn't let me deny it if I wanted to, but there are many cases of an author losing his rights to a publisher, and I can't think of even one that went the other way. Even today, when writers have battled to achieve better standards, better status at the bargaining table, than in the bad old days, it still happens all too often; sometimes with the writer for hire contract we heard discussed this afternoon, in which many writers simply sign away all rights without knowing what they do.

One major magazine publishing company still automatically sends a writer for hire contract to every contributor. Experienced, or halfway intelligent contributors, or those with good agents send

them back indignantly and then they send the real one. But those who are not experienced or have good agents often sign them and then they are bound to forever report that they can't get their rights back.

Some book publishers offer similar contracts. A writer has been around for a while usually can deal with that too, but an inexperienced writer or a hungry one is under strong pressure to sign. And thus his rights are lost to him.

In short, publishers can readily take advantage of writers under some conditions, and unfortunately, some of them do. This is a fact of life that has been recognized in the statute law. For this reason, under the old copyright law the second term of the copyright could be obtained only by the writer himself or his heirs. And I think the creators of copyrightable material are in justice entitled to and often desperately need such special protection, still.

So what I would urge on you, if I might, is to keep a special thought in your minds for the originators of the copyrightable material. Heaven knows, the task of framing copyright legislation for the new high tech media is complex and arduous enough already, but very large sums are potentially involved and my plea is that in providing for proper payments through royalties or licensing fees or whatever, some of that money get back to the creators.

Whether that happens, and to what extent it happens is of course a matter of copyright law. Copyright is dear to my heart as a writer, because it is the only thing I own that is all mine. Let me give you an instance of how important copyright can be to a writer.

Nearly thirty years ago, a young writer who is a close friend of mine died suddenly of a heart attack as a result of injuries received in the Battle of the Bulge, leaving behind a widow and two small children. Both of his children were handicapped. His widow had no choice but to stay home and spend her time with the children. My friend's entire estate, apart from a mortgage, consisted of his copyrights on about eight novels and a score of shorter pieces. If they had not been protected, his family would have been wholly without resources. It is only the income from these copyrights that has kept them off welfare for the last twenty-odd years—Heaven knows, sometimes very poor, but never quite penniless.

But, of course, copyright means more than money to a writer. We had some talk about that this afternoon. It gives him the right to tell a prospective publisher that he cannot publish the work at all unless he publishes it in a way satisfactory to the author. The only way he can do that, really, is by writing it into the contract and that sort of clause usually takes a lot of hard bargaining. But it can be done.

Six months ago, I was in the People's Republic of China which does not honor copyrights. That isn't just a peculiarity of the communists. In all of China's 4,000 year history they have never had a copyright law or anything resembling it. From the point of view of the present government, there's not much incentive to change. Nothing can be published anywhere in China anyway without the smile of the state, and there is no reason for them to protect their writers' residual rights in a literary problem, since the writer's income is subject to a cap. No matter how good his book is or how many copies he sells, he cannot make quite as much as $1,000.00.

The payment of royalties simply does not happen. One of the heads of the writers' union told me that every few years, the subject of the royalty payments comes up and is discussed and rejected. "Perhaps," he said, "at some future date, they might institute some sort of bonus for certain writings, but not right away."

On the foreign side, they see no reason to join the International Copyright Convention because that would force them to spend their foreign exchange on rights that they now simply take for nothing. Worse, it might involve them in the arduous problem of writing contracts with the foreign authors who might well demand that what they wrote be published the way they wrote it.

I'd like to give you an example, or an idea, of how the Chinese feel toward the work of western writers they pirate. A given story, instead of being "by John Smith, translated by Yun Yow Dow," may well appear as "by Yun Yow Dow, based on a story by John Smith." Just how much the translated stories are altered to conform with the views of the Chinese authorities I cannot tell you, since I can't read Chinese. But while I was in China, I was given a copy of an anthology, which I was told contained a story of mine and I am now having it translated back into English to find out just what it was that I said there.

On the other hand, the last time I was in the Soviet Union, or I hope it was the last time, I spend some time in the office of one of the largest Soviet publishers, talking with their editor-in-chief. He showed me a new edition of a novel called "The Day of the Triffids," which was written by an English friend of mine named John Wyndham, now deceased.

I remembered that there was a section in the book that suggested that the deadly man-eating plants that the book was all about had come to plague the earth as a result of some illicit biological warfare experiments carried on in Soviet Russia. I was curious to know how they dealt with that, and since I could not read the Russian, I asked the editor if it had given them any political problems. He grinned and shook his head. He said it was no problem at all. He just left it out. [Laughter.]

The other thing they left out—I didn't have to ask him this because I knew—was paying John Wyndham royalties for the publications of his novel. They had not yet signed the Copyright Convention at that time. Their practice, they said, was to pay lavishly in rubles for everything they publish and deposit the money in a Soviet bank to the account of the author so that when he came to the Soviet Union he could draw it out and spend it. That's what they said they did.

In practice, it was a little different. When I first visited the U.S.S.R. in 1971, I came with bright hope because I had had a couple of books published in the Soviet Union, one of them in more than one language, and it had been told to me by a Russian friend that I could live elegantly for a long time in Moscow by spending my accumulated rubles.

Unfortunately, my friend had neglected to tell me that it was fairy gold. It evaporates before your eyes. When I asked for my rubles, the publisher said apologetically that there was a law that said that if they weren't claimed within three years they reverted back to the state, and I had missed the deadline.

Of course, since then, they've signed up with the rest of the world, and now they pay in dollars and sign contracts which they are obligated to carry out. (Which may be the reason why since then none of my works have appeared in the U.S.S.R.)

All of which suggests to me that the passage of the Copyright Law or treaty is not enough to protect the writers' interests by itself, but it certainly is the very first step.

My colleague and fellow Authors Guild council member, Joe Lash, said many of the things this afternoon that I had planned to say myself. I support all he said and enjoyed his talk a great deal, even though it cost me four pages out of this one—though that may not be a bad thing.

So let me end by sharing with you just three specific points that I would like to mention.

First, the economic interests of authors and publishers—electronic and otherwise—are not always the same. Where they differ, it is usually the author who needs statutory protection more than the publisher.

Second, the author has also a moral right in his work. Judge Breyer pointed out that the courts seem to concern themselves more with economics that with morality—but not at all with the moral rights. Neither do our statutes, although in some countries, in particular France, there is a statute on the books which specifically enforces that the author's right to see his work published in a way he wants it or not at all. I wish we had such legislation here.

Third, the need for copyright in the work of authors as against, say, the copyrighting of software, is not the same. Last night's speaker said, quite truly, that for much software a three-year term is plenty, because long before that the software is outmoded anyway. But I think it important to realize that this is not true of works of creation. George Orwell's novel, "1984", is only about a dozen years from going out of copyright in the second term, but it is at the present time—or was last week—number one on the best-seller lists.

So when it comes time to amend the copyright law, I hope writers' rights will not accidentally be lost in the commendable effort to safeguard the rights of others. Of course, it might be that all this would take place in the proper forum without any nudging from any writer or any other person, just by the natural workings of the legislative process. I might believe that—right after I first start believing in ESP, and flying saucers, and dowsing, and the Tooth Fairy.

Thank you very much. [Applause.]

CONCLUSION

Mr. KEPLINGER. Thank you very much, ladies and gentlemen. For those of you who are going to tour the IBM facility, the bus will be leading at 8:30 sharp in front of the hotel, and proceeding directly from that tour to the airport.

So, thank you very much for your participation this evening. Thanks to Mr Pohl, thank you very much.

[Whereupon, proceedings were concluded.]

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